Subterranea

The Magazine for Subterranea Britannica

Subterranea Britannica **April 2023 Issue 62**

IN THIS ISSUE

Inchindown Fuel Tanks
Harwich Fortifications
Dumpy Level - Dover Castle
Kent Coalfield

Subterranea Britannica is a society devoted to the study of man-made and man-used underground structures and the archaeology of the Cold War. The society is open to all and its membership includes all walks of life.
Members are invited to contribute to this magazine even if this just means sending very welcome snippets from newspapers and magazines.
Contributors to *Subterranea* also give their permission for articles and images to be reproduced on Sub Brit's website.

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Front cover photo: *The vast interior space of Inchindown No.1 Tank, one of a set of six underground oil storage tanks at this location serving Invergordon and the defended naval anchorage of the Cromarty Firth. This one tank alone held over 5.5 million gallons (17,500 tons) of furnace fuel oil. From 1937, the Admiralty built major protected oil storage facilities such as this at Portsmouth, Lyness (Scapa Flow) and Inchindown with smaller ones at most other naval ports. Photo Tim Wellburn*

Back page upper: *The Sub Brit group and our guides, Preston White and David Cook, outside the portal to the secondary access gallery at Inchindown which services the far (northern) end of the oil tanks. Photo Clive Penfold*

Back page lower: *Some of the Sub Brit group pose in front of the 1941 Type 287 RDF array on the top floor of the Harwich Radar Tower. Most of the array is original and has two 'pig trough' reflectors - the transmitter on top and the receiver below. The array has been painstakingly restored (and new dipoles added) by the Harwich Society. Photo Gerald Tompsett*

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Newsletters of Subterranea Britannica are published by the committee of Subterranea Britannica. Original articles, book reviews, press cuttings, extracts from books and journals, letters to the Editor etc are welcome.
However the Editor reserves the right not to publish material without giving a reason.

The committee of Subterranea Britannica and the Editor do not necessarily agree with any views expressed and cannot always check the accuracy of any material sent in.

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Printed by Designosaur UK Ltd., First Floor, Albany House, Elliot Road, Bournemouth, Dorset BH11 8JH 01202 914790
Subterranea Britannica A Company limited by Guarantee Registered in England and Wales Registration No. 6447148
Registered Charity Number 1141524 Registered Office: Heathend Cottage, Windsor Road, Ascot, Berkshire SL5 7LQ

ISSN 1741-8917

Chairman's Welcome

Tim Wellburn

I pen this hotfoot from a fascinating visit to Brompton Cemetery and its historic catacombs, led by expert Robert Stephenson, Chairman of the National Federation of Cemetery Friends and a trustee of the Friends of Kensal Green and Brompton Cemeteries. Those who attended last year's Spring Day Meeting will recall his wonderful talk on 'Premature burial tricks and traps'. At Brompton on Sunday, he 'counted-us-in' and 'counted-us-out' of the catacombs to avoid such a fate befalling any Sub Britter, and his knowledge certainly brought the place, if not its longer-term residents, to life.

This visit was arranged as an adjunct to this year's AGM and Spring Day Meeting where, among a diverse range of speakers and topics we heard from another expert in his field, Peter Faulding, probably the world's leading expert in forensic search and rescue. His recently published book, *What Lies Beneath,* is reviewed in this issue and is worth reading just for the insight into the challenges involved in safely extricating environmental protesters such as 'Swampy' from their alarmingly complex and dangerous tunnel networks.

Members contributed to the day's visual interest through a projected display of excellent submissions to Sub Brit's photography competition – thank you to all those who entered – and congratulations to overall winner Jamie Bentley for his superbly atmospheric picture of the interior of one of the vast Inchindown underground oil storage tanks in Scotland. As you will have deduced from this *Subterranea*'s cover, our visit last autumn to this iconic site is written up in this issue.

We also had short presentations from three members, including two on intriguing structures unknown to most of us: a unique survivor of a bizarre (and unsuccessful) WWII anti-aircraft illuminator; and the access tunnels of the uncompleted and abandoned Admiralty underground oil storage facility in Plymouth. The third cast light on the variety of underground attractions in Brno in eastern Czechia.

It would be good to see more such presentations by members, so dig into your personal explorations and share them with us!

The Day Meeting seemed to be greatly enjoyed by members and, as usual was a great opportunity to socialise, meet old friends and make new ones. These events take a great deal of time and effort to organise, and their viability depends on strong patronage; with fewer than seventy participants the cost of this one dug several hundred pounds into our reserves.

In conjunction with our AGM, we now hold only one Meeting per year, so it would be really good if more members could make the effort to venture from their bunkers, armchairs or other natural habitats to support and enjoy these occasions before they become just another memory.

chairman@subbrit.org.uk

The old switchboard in the 10-Z Bunker, one of the many underground tourist attractions in Brno. The bunker is located under the hill leading up to Špilberk Castle. It was built during the Nazi occupation and was designed as a fallout shelter against nuclear attacks from American and Soviet forces

SUBTERRANEA BRITANNICA DIARY

Summary of Forthcoming Events

2023

Sub Brit specific events

27-28 May Liverpool weekend

3 June Committee Meeting

1 July Copy deadline for *Subterranea* 63

End-August *Subterranea* 63 published

9-16 September Polish trip with CDSG and FSG

Other trips are in the pipeline, but not firmed up yet

Other Underground related events

22 - 25 May 2023 2nd International Conference of Mining and Underground Museums, Cracow Saltworks Museum in Wieliczka, Poland

10 June Reigate Caves Open Day www.Reigatecaves.org.uk

7-10 July NAMHO conference, Grasmere

15 July Reigate Caves Open Day www.Reigatecaves.org.uk

Sat 15 July 12.00-4.00 Cuckfield ROC Post open

Sunday 16 July 10.00-2.00 Cuckfield ROC Post open

12 August Reigate Caves Open Day www.Reigatecaves.org.uk

Sat 12 August 12.00-4.00 Cuckfield ROC Post open

Sunday 13 August 10.00-2.00 Cuckfield ROC Post open

9 September Reigate Caves Open Day www.Reigatecaves.org.uk

September 2023 Hidden Earth Association (BCRA) annual caving conference Dates and venue to be confirmed

For up to date information about these events
please visit www.subbrit.org.uk/events
or contact the organisation concerned

If you know of other relevant events run by other societies, please let us know so that they can be advertised in the next edition and on the website

Happy Anniversary to Us

Subterranea was first published in January 2003 so this is our 20th anniversary. The late Dan McKenzie was our first editor and Nick Catford has been editor since December 2007 (*Subterranea 15)*. We look forward to our next 20 years.

Philip Lindhurst 1955-2023

As this edition of *Subterranea* went to press we were saddened to hear of the death of long term member Philip Lindhurst. Philip was well known to many members, in particular for his great support for Paddock open days and for his many 'behind the scenes' tours of London Underground stations. He posted to the members' forum just a couple of weeks before his passing. Philip's career was spent in signalling and line control at London Underground. Our deepest sympathies are extended to Philip's family, friends and former colleagues. A fuller appreciation of Philip's life will be included in the next edition of *Subterranea.*

Subterranea Britannica Annual General Meeting 2023 – Minutes

11 March 2023, Canada Water Theatre, London

The meeting was opened at 10.00 by the Chairman, Tim Wellburn, who welcomed all those attending, especially so many new members. 67 members were present.

1. Apologies were received from:

   Dave Taylor, Geoff Manaugh, Sarah Cash, Jonathan Maisey, Roger Gosling, John Burgess, Mike Moore, Ian Jackson, Fiona Buchanan.

2. The Minutes of the AGM 2022 held on 23 April were published to all members in ***Subterranea*** #60, August 2022. It was proposed by Bob Templeman and seconded by Nigel Wall that the Minutes were a true reflection of the meeting; the proposal was accepted by those attending with no abstentions.

3. Annual Report for the year ended 31 December 2022. This has been made available to all members on Sub Brit's shared document drive. Tim highlighted a few of our achievements of 2022:

   - Financial reserves strong
   - Membership strong at 2022 year-end = 990, up slightly on previous year. Tim encouraged attendees to try and attract more members as there is benefit (financially) in keeping to the 1000 members.
   - Over 13,000 subscribers to social networking channels
   - 3 new issues of *Subterranea*
   - *Subterranea* editions 53-55 added to our publicly accessible archive
   - Responded to membership survey feedback to improve membership experience
   - Delivered a substantial programme of underground or underground-related site visits
   - Spring Conference and site visit to Crossness Pumping station
   - European Study Visit - major underground fortifications along the Maginot line
   - Autumn Study Programme with site visits & lectures, based in Edinburgh
   - New grants authorised totalling £2,400

4. Accounts 2022: Sub Brit's Accounts have been signed off by the Committee and Independent Examiner and have been filed at Companies House and the Charity Commission. They will also be on Sub Brit's website.

5. Elections of Officers and Committee. Tim introduced all the Committee members attending today – all bar Dave Maguire and Richard Seabrook.

   The motion that nominations for Sub Brit's Committee be considered '*en-bloc'* was proposed by Clive Penfold and seconded by Bob Clary. The motion was carried unanimously.

   The motion to elect the following Committee members was proposed by John Lill and seconded by Penny Eisen. The motion was carried unanimously.

   The elected Committee for 2023/24 is:-

Tim Wellburn	Chairman
Neil Iosson	Vice-Chairman (Website content)
Linda Dixon	Secretary
Tony Radstone	Treasurer
Richard West	Membership Secretary
James Buller	Member (Social Media)
Phil Catling	Member (SB Meetings)
Martin Dixon	Member
Dave Maguire	Member (Subterranea content and Visits)
Richard Seabrook	Member (Technology)

6. Subscription Rates for 2023. Tim reminded people of the rationale, which had been distributed with the AGM papers. Sub Brit's aim is to cover our costs, not make a profit or loss. Costs have gone up markedly recently and the proposal is to increase the subs from £25 to £28 to cover this increase. Some questions were raised.

Q1: Would it be better to stop producing a hardcopy magazine and just do a pdf?

A1: The recent survey showed that the vast majority of members want to keep a printed copy; and it is more economic (postage wise) to produce and send 1000 copies.

Q2: Other groups have higher subs (e.g. ARG £30, FSG £50) – why not put it up to £30?

A2: The committee considered this but decided it might have too big an impact on some members.

Q3: Have we considered life membership?

A3: No, but this can be tabled at the next committee meeting.

The meeting was asked to vote on the increase to £28; the vote was unanimous with no abstentions.

The Chairman finished by outlining some of the events underway for 2023:

- 5th Site Visit to Mail Rail (January)
- SB AGM & Spring Meeting & Visit to Brompton Cemetery Catacombs (March)
- Site Visit (by ballot) to Windsor Castle Sally Port & St. George's Chapel (March)
- Site Visit (by ballot) to Warren Row WWII Aircraft Factory / RSG, Henley (April)
- Site Visit to Short's Tunnels, Rochester (April)
- 6th Site Visit to Mail Rail (April)
- Denmark Study Weekend (April)
- Liverpool Weekend Site Visits (May)
- Mid-England Barrow - Sub Brit Open Invitation for Individual Visits
- North Poland Fortifications Special Tour (September)

The AGM officially closed at 10.25, and was followed by the Spring Meeting.

Index of *Subterranea* magazine issues 51-60

Linda Dixon

Please find enclosed with this edition of ***Subterranea*** the consolidated Index of Issues 51-60. The first issue was back in 2003, and with roughly 70 pages per issue, that's about 4,000 pages of information about underground sites. On average there are eight main articles per issue, so that's about 500 pieces of in-depth information published as an archive – in fact, even more than 500, if you take into account the News sections.

The Index will also be available on our Members' Forum consolidated with the Index of issues 1-50 (published with ***Subterranea*** No.54, August 2020). The Forum version has additional Keywords, giving more detail about the sites in the articles. This version will be fully searchable, so hopefully you can find any site you are interested in. Much of the site information has also been finding its way onto the main website.

If you would like hard copy of any previous issues of ***Subterranea***, or the Index os issues 1-50, then email us at 'Publications@subbrit.org.uk', telling us which issue(s) you would like and who/where to send them to. Issues are priced to include Post and Packing as follows: 51-60 at £5 each, 31-50 at £4, 21-30 at £3 and 1-20 at £2. Soft copies of the older magazines are also on our website.

If your insert is missing and you would like one, please contact us at 'Publications@subbrit.org.uk' or by post to our registered address. We also have copies of the Index of issues 1-50.

NEWS

Miscellany compiled by Nick Catford

NEWS – ARCHAEOLOGY

New tunnel found in Great Pyramid of Giza

A mysterious hidden corridor buried deep inside Egypt's Great Pyramid of Giza has been seen for the first time. Scientists discovered the passageway in 2016 but did not want to damage the 4,500-year-old monument to gain access to it, so embarked on a years-long project to take a sneak peek at the secrets the cavity might hold.

Using an endoscopic camera and a technique called cosmic-ray muon radiography, experts were able to map the corridor for the first time and confirm that it is 30ft long and 7ft wide. They also said it was likely designed to help redistribute the pyramid's weight around the entrance or another as yet undiscovered chamber.

The 479ft-tall pyramid, which was built as royal burial chambers around 2560 BC, is the only one of the Seven Wonders of the Ancient World still standing. Until the 1889 construction of the Eiffel Tower it was also the tallest human-made structure ever built.

Officials announced the finding in early March and said the unfinished corridor, which is behind the main entrance, could contribute to knowledge about the construction of the pyramid. It was likely built to relieve the weight of the pyramid on either the main entrance, 22 feet below, or on another as yet undiscovered chamber or space, according to Mostafa Waziri, head of Egypt's Supreme Council of Antiquities.

"We're going to continue our scanning so we will see what we can do to figure out what we can find out beneath it, or just by the end of this corridor," he told reporters after a press conference in front of the pyramid.

Scientists detected the corridor through cosmic-ray muon radiography, before retrieving images of it by feeding a 6mm-thick endoscope through a tiny joint in the pyramid's stones.

SOURCE: *MailOnline,* 2 March 2023

Human bone found in Williamson's Tunnels

Police are investigating after a bone was found in Liverpool's Williamson's Tunnels during an archaeological dig. Merseyside Police said a bone fragment, believed to be a human remain, had been found in the tunnels beneath the city's Edge Hill area.

A force spokesman said forensic tests were taking place to confirm the type and provenance of the bone. Volunteers have been working for the past decade to clear out the mysterious labyrinth of tunnels. The tunnels were built and conceived in the early 19th century by businessman Joseph Williamson, who paid soldiers returning from the Napoleonic Wars to build them. No records were kept of how far they stretch or why they were built.

After Mr Williamson's death in 1840, the tunnels fell into disrepair. The site was filled with more than 100 years' worth of ash and debris from a local bakery. The Williamson Tunnels Heritage Centre posted on social media that the discovery was made 16ft below the tunnel floor. Digging has since been suspended and the area has been sealed off.

SOURCE: BBC News Liverpool, 27 March 2023

NEWS – CONSERVATION AND HERITAGE

Finds at Pope's Grotto throw light on poet's tunnel vision

The famous grotto is all that remains of the neo-Palladian villa and gardens built in 1720 on the banks of the Thames at Twickenham by Alexander Pope, the great poet, satirist and garden designer.

Now conservation work has led to "extremely significant" discoveries in this subterranean "classical nymphaeum" that inspired his poetry, revealing that his surviving rough sketches were not some "fanciful conceit" but were actually constructed.

In removing a later concrete floor and cement repairs, experts have found an an underlying brick floor and part of a rill, or conduit, that appears to run from a hidden water feature – recognised from Pope's sketches and a

letter he wrote. It is thought to be a key part of the poet's vision for the grotto. They have also exposed decorative structural details of the grotto such as the original plaster work and the vaulted brick cellars of his villa, including a blocked-up arched opening.

Between 1720 and 1742, Pope created a "subterranean way" in the villa's cellars, an 80ft-long tunnel with chambers beneath a public road that took Pope and his visitors directly from their riverboats, underneath the house, and into his garden.

He turned it into a seemingly natural cavern, encrusted with rocks and minerals with reflective surfaces that played with the light from the river that it once overlooked. In 1725 he wrote that when the grotto is lit up with lamps, "a thousand pointed rays glitter" off glass and mirrors in the walls.

Judith Hawley, professor of 18th-century literature at Royal Holloway, University of London, and a trustee of Pope's Grotto Preservation Trust, believes the new discoveries are "vitally important".

After Pope's death in 1744 his villa was demolished but the grotto was left. It will reopen to the public next year after the work is complete.

SOURCE: *Daily Telegraph*, 3 October 2022

Ironbridge Gorge Museum's 50th anniversary, Shropshire

This year, the Ironbridge Gorge Museum Trust celebrates the fiftieth anniversary of their Blists Hill Victorian Town, where several rustic activities are demonstrated; candle dipping, brick making, blacksmithing, iron founding, poster printing, coracle making and more. There's a café and pub selling good real ale (unfortunately at today's prices!). The whole site is definitely worthy of a whole day out.

Two of the most innovative structures in the area are featured below.

The Hay Inclined Plane (Grade II listed), constructed in 1793, connected the industries that used to be on the site of Blists Hill with Coalport, 207 feet below. Boats with goods descended the inclined plane which removed the need for negotiating 27 locks taking over three hours, as opposed to four minutes. Materials loaded into tub boats were pulled along the canal by horses, the tubs were placed onto wheeled cradles which descended on railway tracks. Once in the canal at the lower level the cargo was trans-shipped into larger boats on the River Severn. The inclined plane closed in 1907; the photo shows it when still in operation about 1880.

The Tar Tunnel (house at entrance Grade II listed) at Coalport, constructed in 1786, may originally have been part of a grand plan to go further into the hillside, then connect to a vertical shaft. However, 900 feet from the entrance, natural bitumen springs were found in sufficient quantity to justify exploiting this phenomenon until the 1850s. Photo shows the Tar Tunnel after conversion to a tourist attraction.

Photo Nick Catford

A good account of the Mines and Tunnels of the Ironbridge Gorge by the late Ivor Brown is in Issue 98.4 of *Below*, the journal of SCMC.

SOURCE: Roger Gosling

NEWS – HEALTH AND SAFETY

Fatal incident at Dugald River Mine, Queensland, Australia

Two Barminco contractors, Trevor Davis and Dylan Langridge were killed after a light vehicle they were travelling in fell into a stope, at 8.55 am on l5 February (Queensland time). A search and rescue effort was able to locate them; however, the two had suffered fatal injuries.

The two men were reported to be "fly-in, fly-out workers", a common practice in parts of Australia where staff are flown temporarily to remote work sites. They had worked at the Dugald River mine since 2021 and 2020 respectively, as charge-up operators, a role that usually involves handling explosives and setting up blast areas for mining.

Dugald River Mine

Dugald River is 100 percent owned by MMG Limited and is one of the world's top 10 zinc operations. Due to the scale of the ore body, Dugald River was commissioned in November 2017 and is estimated to have a mine life of 20+ years to process an average of 1.7 million tonnes of ore per annum.

Ore is mined underground using diamond drilling techniques, after which it is extracted to the surface and treated on-site. Zinc concentrate, with by-products including lead and silver is produced. Concentrate is transported to the Port of Townsville via rail departing from Cloncuny. The operation employs around 500 employees and contractors on a mix of fly-in, fly-out and local residential basis.

SOURCE: *Below* – Journal of the Shropshire Caving and Mining Club, Spring 2023

Chinese open cast mine collapse

At least four people have died and 49 more are missing after the sides of an open cast mine, operated by the Xinjing Coal Mining Company, in China's northern Inner Mongolia region, collapsed around 13:00 local time (0500 GMT) on 22 February. The collapse left a pile of debris roughly 500m across and 80m high.

Rescuers work at the site of a collapsed open pit coal mine in northern China's Inner Mongolia region

It is not yet clear what caused the side of the mine to give way. At the time of writing, six survivors have been found. Over 900 rescue workers have been deployed to the site, but their efforts to retrieve others were temporarily disrupted by a further two "large" landslides.

Police told Chinese TV that an investigation was underway, and that the relevant persons have been "controlled". Mines in China's Inner Mongolia region are some of China's top coal producers. Chinese mines have been trying to boost output over the past year.

Accidents are not uncommon in China. In December 2020, 23 miners died after a carbon monoxide leak at a coal mine. In January 2021, 10 miners were killed in a blast at a gold mine in Shandong province.

SOURCE: *Below* – Journal of the Shropshire Caving and Mining Club, Spring 2023

Uranium mine collapse in North Korea

The uranium mine that feeds North Korea's nuclear weapons has been rocked by a series of cave-ins, with the scale of the disaster visible from space. Jacob Bogle, who has created a comprehensive map of the country from satellite photos, discovered the collapse in recent images of the Pyongsan mine. The mine is the regime's main source of uranium ore, which can be refined into yellowcake and ultimately weapons-grade uranium. And it's less than a kilometre away from the only operational plant in North Korea that can process the ore into yellowcake.

Now the mine has been hit by disaster, with satellite photos capturing the sudden appearance of large depressions in the earth close to the mine entrance. The Pyongsan mine is underground, so the only visible aspects of it should be tunnel entrances, surface facilities like crushing equipment, and piles of coal. However, what has developed at the mine is a series of irregular pits with no associated activity – no trucks, no bucket excavators, and nothing to suggest they were created to facilitate mining. Two such pits, each more than 100 metres across, are clearly visible in satellite photos. This area of the mine was already weakened by a 100-metre-wide collapse that occurred at least two decades ago. The recent collapses appear to be progressive, moving towards the west in successive cave-ins from 2019 to 2021. This suggests that the mined-out galleries had lost their structural support and water infiltration

has weakened the site further, causing collapses that follow the paths of the galleries.

SOURCE: *MailOnline*, 19 January 2023

Coal Authority launches its *Stay Mine Safe* campaign

During the Easter Holiday period the Coal Authority launched an awareness campaign called *Stay Mine Safe*.

Due to a rising number of incidents that the CA are responding to, the basis for their campaign is to raise awareness amongst key stakeholders and the public of common mining-related hazards that take place on the coalfield of the UK, which accounts for around 25 percent of all homes and property.

To that end Lee Kilby, a Community Response Manager at the Coal Authority, is keen for us to share our campaign animation on your social media channels when the campaign begins on 7 April.

As you and your members, staff, volunteers and visitors work in or on areas where these hazards could be encountered, it would be really beneficial for the campaign if you would be willing to give the content a quick like and a share!

You can view the CA's Social Media animation here: https://youtu.be/_FWUU-e4DK4

SOURCE: *Coal Authority*, 31 March 2023

NEWS – MILITARY AND DEFENCE

Special honour for Largs 'secret bunker' museum man

A dedicated volunteer from Largs in Ayrshire has been recognised for his work running Skelmorlie's Secret Bunker. Frank Alexander received the top Palladium voluntary award at a special presentation by the leader of North Ayrshire Council, Marie Burns. It was in recognition of some 20 years in restoring the derelict monitoring post and turning it into a valued heritage and museum site.

Frank was given the Adult Volunteer Recognition Award for outstanding contribution in a volunteering role with 25 Group Royal Observer Corps Association – and revealed he only joined because of a piece in the Wee Paper some 25 years ago.

Skelmorlie is one of the very few restored Royal Observer Corps underground monitoring posts open to the public after being mothballed when the Cold War ended in 1991.

Frank, who is a retired team leader from Hunterston Power Station, joined the Royal Observer Corps after he noticed an advertisement in the *Largs and Millport News* in the 1990s and became an observer lieutenant. He recalled: "I remember seeing that the former nuclear monitoring post was in a derelict condition in an overgrown field and I had this mad notion to restore it in order to publicise the role of the Corps.

It opened in September 2004 in time for the Doors Open Day in Ayrshire – it is great to think it will have soon been operating for 20 years. "We have had thousands of visitors from all over the world in that time, including from USA, Canada and Australia", he said.

"There were a number of sites all over Scotland with nuclear monitoring posts including West Kilbride, Gourock, and Kilchattan Bay in Bute, but many of them are now in a derelict state or have been demolished. It is a real shame."

The post's primary function was to monitor and report on the effects of a nuclear attack as part of an extensive chain throughout the United Kingdom. Access was achieved by climbing down a 15ft vertical steel ladder.

Frank Alexander in Skelmorlie ROC post

Frank added: "It is great to receive the recognition given; when we took over the lease of the land in 2003 it was basically a derelict concrete box and now it is a recognised museum site. We are developing a community outreach programme and we have a relationship with the Largs Radio Club to develop it as an amateur radio ham centre. We also have HM Coastguard Unit visiting us once a year to use the site as a specialised unit for training and we also have Scout groups and the Ardrossan Air Training Cadets coming back this year to visit.

"We participated last year in the Queen's Platinum Jubilee celebrations by lighting the beacon and we also had a gazebo at the Viking Festival which unfortunately was wrecked by the storm on the last weekend. If invited back, we hope to run our aircraft recognition competition again this year.

"We are also looking at developing the site as a stopping point for walkers and cyclists as part of the Ayrshire Coastal Trail, providing them with a rest break for hot and cold drinks and toilet facilities. There are lots of things to look forward to."

There is plenty of future events lined up, including a celebration for King Charles' Coronation weekend in May. The beacon will next be lit during the anniversary of the D-Day landings on June 6 next year. To book a visit, email info@skelmorliesecretbunker.co.uk

SOURCE: *Largs & Millport Weekly News,* 7 March 2023

Fort Hubberstone near Milford Haven is on the market

For those looking for a unique property buy, there's a historic fort in Wales now on the market. The property,

Fort Hubberstone, was home to US troops as they planned for the D-Day landings – and even has its own submarine spotting station.

Sadly, the Welsh waterside building, situated on the edge of the Milford Haven estuary, has largely fallen into disrepair – and is now up for sale at £190,000. The coastal property, built in 1859, was awarded a special Grade II rating by heritage chiefs for its cultural importance. The fort was ordered by Lord Palmerston in 1850 as a defensible barracks and gun battery with the work costing £87,894.

It was home to 28 heavy guns and a garrison for 250 men in the barracks and later housed soldiers during both World Wars. During World War II, it was even used as a secret base for American forces during Operation Bolero as they prepared for the D-Day landings, and estate agents say they 'added their influence to the building, which remains evident today'.

It was then bought in 2020 by history lover Guy Anderson, who announced plans to turn it into a 'living ruin' tourist attraction – but the building is already back on the market. Agents West Wales Properties say: 'There are two main buildings with scrubland in between.

'The top building, once the accommodation block for approximately 250 men, was made up of guard rooms, soldier housing, pub, wash rooms, coal store and kitchens, centred around a parade ground with a raised centre.

'The bottom building is made up of seven Gun Rooms, Magazine Rooms and an intricate channel of light and ventilation passages displaying masterful stone and brickwork. Further rooms – currently inaccessible – are yet to be discovered, including a submarine spotting station and caponier.

'The fort is steeped in history which is evident everywhere. You can see the gun tracks, the fireplaces, the wooden framework in the arched windows, and even the decoration on the washroom walls: this fascinating building has so much to explore.'

SOURCE: *Metro,* 12 March 2023

Cold War bunker a life-saver in devastated Ukrainian village

For a Ukrainian village devastated by war, Cold War bunkers built to withstand a nuclear attack that never happened have proven a lifeline for residents who have spent much of the past year living in them. Luch, a southern village, about 40 km northwest of Kherson, was hammered by Russian fire almost from the start of the war when it ended up close to the frontlines.

There, Svitlana Gynzhul is one of five people who reside in a concrete-and-turf bunker, accessed via a door on the side of a grassy mound that leads to a steep, dingy staircase underground. Now she cares for the few neighbours who have remained in Luch.

The need to take shelter in a bunker built 70 years ago for a different threat underlines the desperate measures many Ukrainians have employed in the last year to stay alive. In April, with their village caught between Russian and Ukrainian forces, Gynzhul, her husband Dmytro and their son moved into a warehouse basement, just before their second-storey apartment was shelled.

Then in August, they moved into one of Luch's two abandoned Soviet-era nuclear bomb shelters, built in the 1950s for soldiers who at the time trained in Luch. The heavy metal doors, bunk beds and gas masks had long been stolen.

SOURCE: *Reuters,* 27 February 2023

No Man's Land and Spitbank Fort in the Solent are on the market

No Man's Fort has been on the market for three years with a planning application under consideration to turn it into a home. Permission was previously granted but the approval – granted in May 2020 – lapses after three years.

Fort owner Clarenco has reapplied and is awaiting a decision from the Isle of Wight Council. Agent Rolfe Judd said, in a letter to the council, that there had been difficulty in finding a buyer for the site. If approved the new application would allow a further three years for the property to be marketed as a home.

The agent said the fort had been run as a successful hotel in previous years, but running costs and other issues had meant an alternative use was being sought. The fort, which is one of Palmerston's follies, was built in the 19th century as a line of defence against the threat of invasion from France. It has been on the market since 2019.

No Man's Land Fort

It was decommissioned by the Ministry of Defence in 1956 and then sold to private developers. Its £4.25 million original price tag has been reduced to £3.6 million.

It features 23 bedrooms, a lighthouse, laser battle play area and spa. In 2012, Clarenco (also known as Solent Forts) converted it, adding a helipad, indoor swimming pool and restaurant. Neighbouring Spitbank Fort has also been put up for sale again, for £3 million, with the possibility it could become a home or a hotel.

SOURCE: *Daily Echo,* 8 March 2023

Declassified 1966 BMEWS training film

A recently declassified 1966 training film shows the Ballistic Missile Early Warning System (BMEWS) site in Thule, Greenland, and the men working inside its secret Tactical Operations Room (TOR), where an Air Force officer is shown evaluating information on unidentified objects that may or may not represent a missile launch against the United States.

Beginning in 1960, the radar-based Ballistic Missile Early Warning System was capable of providing the Pentagon with about 15 minutes of warning time in the event of a mass ballistic missile attack on U.S. territory. SAC relied on timely warnings from BMEWS to maintain the readiness of bomber and missile launch crews for speedy action in the event such an attack was detected.

This Air Force training film demonstrates how BMEWS operated in the mid-1960s, including the classified activities of the Tactical Operations Room (TOR), the system's "nerve center." At the BMEWS site 1 in Thule, Greenland, 600 miles north of the Arctic Circle, one of the TOR staffers is at work "looking for something, and he hopes he never sees it."

With a capability of looking some 3,000 miles into space over the Eurasian landmass, BMEWS was able to track missile launch activities and any satellites heading towards North American air space, with the key purpose of detecting and providing warning of a "mass raid" of ICBMS, which TOR operators were trained to recognize.

Taking a deep dive into BMEWS technical operations, the narrator provides a tour of the BMEWS site, showing the huge radar reflectors, tracking radar, nine-foot tall vacuum tubes, and the 35 miles of wave guides that sent

The Ballistic Missile Early Warning System, or BMEWS at Thule, Greenland

radar energy to the antenna and back. All were used to project two fan-shaped beams of radar energy into space to detect missile launches. BMEWS had three sites, one at Thule, Site 2 at Clear, Alaska, and Site 3 at Fylingdales Moor in the United Kingdom.

According to the narrator, with the three sites, the U.S. had the Soviet Union "covered like a blanket," enabling BMEWS to "give a pretty good case history" on where a detected missile came from and its impact point. When tracking radar picked up suspicious activity, the TOR could warn NORAD [North American Air Defense Command], SAC and the Pentagon immediately.

The 27-minute YouTube video is here: https://www.youtube.com/watch?v=yS1ny0r28K4

SOURCE: US National Security Archive

Zelensky's war rooms in Kiev

Ukrainian President Zelensky has given an insight into his top-secret war rooms inside a bunker in Kyiv where he has lived for the past year to mark the one-year anniversary of Russia's invasion.

In an interview with Ukrainian journalist Dmytro Komarov, Zelensky showed Ukrainians around the small space where he makes vital decisions, holds crunch meetings and telephones heads of state from all around the world.

In an interview with Ukrainian journalist Dmytro Komarov, Zelensky showed Ukrainians around the small space in his bunker

Recalling the first hours of the war, Zelensky described rushing to his war rooms after being informed of Putin's invasion in the early hours of 24 February 2022. He left

immediately, without even waking his wife: "I love my family, but for me as president, being here was a priority."

On his desk lie models of planes and a photograph of him and his wife Olena, along with their two children, as well as a bust of wartime leader Winston Churchill. His office is also bedecked with models of tanks and a Ukrainian flag.

Showing Mr Komarov a large room complete with tables and chairs, President Zelensky shared his initial memories and thoughts with the Ukrainian people. He said: "It's very difficult to remember all the details. I got a call that it all had started.

"We woke up with my wife, my family, my son, my daughter [asleep]. I definitely thought about waking the kids up, packing up everyone. To tell the kids what is happening, that the war had started. They are adults, they must understand what's happening. I left very fast." He added his family then joined him hours later after security forces decided it was too dangerous for them to remain separate from Zelensky.

Zelensky then showed the journalist his official office, where he has made the vast majority of his videos sharing updates on the war and asking for help from western nations. He spoke to 27 national leaders on the morning of February 24, Zelesnky told Mr Komarov, sitting in his desk chair next to the phone he has so often been pictured using.

The president said he did not have time to consider the impact of the war upon his marriage or separation from family: "We didn't have time for such romance, because we've been kind of busy. The only thing I remember I was thinking about [after the invasion] was this office, the phones, the team I have to gather now."

As well as ample office space, Zelensky's war rooms are complete with a wardrobe filled almost exclusively with khaki and wartime clothing. The president has not been seen in a suit since the beginning of the invasion, but does have the one he last wore as war broke out tucked safely away in the wardrobe.

SOURCE: *MailOnline,* 26 February 2023

WWI tunnel to become a war grave

The remains of more than 200 German soldiers who were buried alive in a tunnel in northeastern France during World War I will not be recovered. The German government has instead decided to declare the burial site a war memorial and put it under state protection.

Germany's war grave commission, the Volksbund, and the French government announced the decision at the Caverne du Dragon museum in northeastern France in February.

Rescue efforts to reach the remains in 2021 and 2022 had proven very difficult, despite several attempts to open the very deep and very long tunnel, which is located in a nature reserve with sandy ground still contaminated with ammunition.

Although the Franco-German team managed to see as far as 210 feet down the tunnel, they did not find any remains. Many WWI battles took place between the French armed forces and German troops positioned on the Chemin des Dames, or 'Ladies' Way,' a crest between two valleys.

A temporary memorial to some of the soldiers of the 111th Baden Reserve Infantry Regiment set up during search excavations at the Winterberg Tunnel in April 2021

On May 4, 1917, during one of the biggest battles of the war, the French army was firing on German soldiers with heavy artillery. An artillery shell hit the entrance of the Winterberg tunnel on the Chemin des Dames. Some of the German troops, from the 111th Baden Reserve Infantry Regiment, fled further into the tunnel, where stored ammunition had exploded and toxic fumes were being released.

The soldiers created a barricade to try to protect themselves from the poisonous gases until they could be rescued, but heavy shelling prevented help from reaching them. The tunnel's entrance collapsed during the attack and just three soldiers out of an infantry of more than 200 were saved. The others suffocated, died of thirst or shot themselves.

Over the years, there had been numerous – including illegal – attempts to find the buried tunnel entrance in the state forest of Vauclair. Last May, more than a century after the event and following years of work, the Volksbund and French partners used precise drilling to confirm the tunnel's location, discovering a large cavity deep underground, with the burial site intact.

SOURCE: *CNN,* 11 February 2023

Iran reveals underground air force base

On 7 February, Iran unveiled a new underground Air Force base called *Eagle 44* in a slick propaganda video. On the wall was a clue hiding in plain sight: a poster with silhouettes of fighter jets. One in particular stands out. It's situated front and centre, and is in the shape of a state-of-the-art military jet that Iran currently doesn't possess, but which officials claim Russia is in the process of selling to them.

Satellite imagery analysis also reveals what appears to be an at-scale model – what experts call a mock-up – of the same type of fighter jet at the base. Combined, the

details suggest two things about Iran's plans: Officials are optimistic about the delivery of these planes, and they could be intending to use this air base to house some of them.

Since September 2022, Iranian military and political officials have publicly touted the supposed purchase of 24 Su-35s, one of Russia's most advanced combat aircraft. Russia has not confirmed the deal, but the details in the video and satellite images suggest Iran is at least making preparations for the arrival of the planes, which officials maintain will happen later this year. It would be the country's most significant upgrade to its ageing fighter jet fleet in decades.

Military cooperation between Russia and Iran has been accelerated by Russia's international isolation and need for military supplies following its invasion of Ukraine.

SOURCE: *New York Times,* 17 February 2023

NEWS – MINES AND MINING

Winsford salt mine is home to the Laura Ashley archive

The industrial site in Winsford, in the heart of the rolling Cheshire countryside, looks a lot like any other, with heavy machinery and piles of grit waiting to be spread on the nation's motorways. Yet more than 500 feet beneath this prosaic setting, in a still-operational salt mine, lies a treasure trove of British fashion history, a repository filled with thousands of rare finds: the secret Laura Ashley archive.

Few labels stir affection and nostalgia like Laura Ashley. Most people over the age of 35 have memories of prairie-style floral dresses or chintz cushions on their grandma's sofa. The fact that Ashley was a real person – and her designs sold on the high street rather than in high-end boutiques – made the brand more relatable than others of the day.

But while its popularity soared throughout the late 20th century (Princess Diana caused pieces to sell out when she wore them), the English romantic countryside look fell out of fashion; the brand failed to move with the times and it finally went into administration during the Covid pandemic.

It wasn't the end of the story, though. Celebrating its 70th anniversary this year, Laura Ashley has risen again. Rather than sell directly, the brand now works with partners: M&S, John Lewis, Next and B&Q. There's also a collaboration with New York designer Batsheva Hay to create a collection of dresses in updated 70s prints from the archive.

Iconic designs from the 1960s, 70s and 80s flank a sample wedding dress that was modelled by Kate Moss

What was the reason for this resurgence? When the firm folded in 2020, global advisory and investment firm Gordon Brothers, who bought the brand and intellectual property rights, had the foresight to preserve the archive, sending everything from the London and Wales headquarters to Deepstore. Part of the UK's oldest working mine, it provides grit for our roads – but also secure storage for over 3.2 million sensitive documents, priceless artworks and historic artefacts.

Public records, museum pieces, private art collections – even Sir Norman Foster's architectural records – sit in caverns excavated from mining millions of tons of rock salt. Larger than 700 football pitches, Deepstore maintains an ambient temperature of 15ºC and balanced humidity, required to preserve delicate materials. Naturally free from ultraviolet light, vermin and flooding, it is also difficult to access. Few even know it exists.

SOURCE: *MailOnline,* 19 February 2023

Parys Mountain copper mine progressing well

Anglesey Mining has made significant progress in advancing its Parys Mountain copper project in Wales and remains on track to become the UK's sole primary copper producer. They've completed the first drilling programme at Parys Mountain since 2012, while an internal review of the Northern Copper Zone shows substantial promise.

Discovered in 1962, this zone was drilled allowing for an internal resource estimate of 17Mt over the space of six years, with what would today be considered an 'exploration target' of 60-200Mt. The explorers then spent a further three years increasing the resource to 33Mt at just under 1.0% copper, without considering the gold, silver, zinc and lead that was also identified but not estimated.

As with other UK mines at South Crofty and Hemerdon, Parys Mountain is classified as a dormant mine site, so Anglesey already holds several extant planning permissions, but they may have to expand the area covered by them.

As one of the metals central to the energy transition, copper has attracted strong interest from investors since prices rose in 2021. But, copper has yet to be classified as a critical mineral by the UK's Critical Mineral Association – a controversial decision.

SOURCE: *Mining Journal,* 17 February 2023

Finnish mine shaft used to test tall elevators

In Saudi Arabia, Jeddah's Kingdom Tower will be taller than any other structure ever built. At more than one kilometre high, this supertall will require feats of engineering that, until now, have been the stuff of science fiction. Like the world's tallest, longest, and fastest elevators, which are being developed in a mine shaft in Finland.

Kone, a Finnish elevator company, has just announced that it won a contract to design and build 65 elevators for the Kingdom Tower – a project that had been stalled until sputtering back to life earlier this spring. The challenge will be a unique one: Elevator technology is one of the major barriers standing in the way of supertall buildings.

First of all, supertall elevators are put under enormous and unusual stresses, like those introduced from wind shear. Traditional steel rope is very heavy – and at supertall heights, the weight of the cord alone becomes massive. Then there's the heat issue: An elevator plummeting in free fall is moving incredibly fast, and stopping it requires a brake system that can withstand 572 degrees Fahrenheit. Those are just a few of the issues at play here – not to mention efficiency and cost issues.

In the Tytyri test tower, Kone can exceed the physical limits of elevators that is difficult to achieve anywhere else in the world. In extreme tests such as free-fall tests, they can put an elevator rack weighing 10,000 kg into a 200 m shaft

How does Kone expect to solve them? By using a technology called UltraRope that it introduced last year. Rather than steel, UltraRope is made out of a carbon fibre core and coated with a special high-friction chemical than can withstand incredible heat and force. Thanks to this coating, UltraRope lasts twice as long as steel cable.

And it's super light, which means it takes less energy to hoist it up a kilometre-high building. Kone's head of technology told *Construction Week* that a 400-meter elevator's steel cable would weigh 41,116 pounds. The same length of UltraRope cable weighs 2,579 pounds.

To design all lifts for buildings so tall they don't exist yet, Kone does the opposite: It digs down. Way, way, down: 1,000 feet into a mine shaft in southern Finland that dates back to 1897. That abandoned mine was a perfect solution hiding in plain sight, and in 2008, Kone turned it into elevator testing facility. It's the only testing facility of its kind on Earth, and though the maximum testing depth is only 1,000 feet – not one kilometre – it's enough to test the technology Kingdom Tower will need.

SOURCE: *Gizmodo* website

Mine collapse in Cornwall

A 6.5ft wide hole opened up in a residential garden on the outskirts of Redruth, in an area full of historic mine workings. Cornwall Council said the residents "made their own arrangements to leave their homes". It said the owners were advised to contact their insurers and appropriate mining engineers for advice. Several homes lost electricity when the collapse happened on Sunday night and Western Power Distribution brought in a generator to provide supplies.

Residents said they had been told the power would be cut off again this weekend while the temporary supply was switched off and the supply routed via a newly installed telegraph pole. Dale Foster, from Wheal Jane Consultancy which specialises in historic mine workings, said the area was previously the site of mine engine housing as part of the Wheal Trefusis copper and tin mine.

He said the whole area was "riddled" with mine workings – some of which were not properly documented. Mr Foster said: "In this case this was a known shaft; I would assume people would have considered it was already remediated to an appropriate standard." He added, "It's a very extensively mined area and this side of Redruth tends to be one of the earlier mined areas. Mining activity

in this area of Redruth had finished by the mid-1800s to late 1800s so a lot of the mine workings here were less well recorded."

SOURCE: BBC Cornwall, 24 March 2023

Scotland's only gold mine to expand

Scotgold Resources has been developing mining work at Coronish near Tyndrum since 2007. Now the company is aiming to ramp up extraction and wants to develop new sites nearby. By the end of this year, it aims to be extracting about 2,000 ounces of gold monthly, worth more than £3m.

The miners are following a quartz vein with sulphides in it. It runs through the mountain. They are looking for pyrites, sulphides, different minerals, because the gold isn't visible to the naked eye. A team of geologists map the vein and tell the miners which direction to drill into the rock.

They then charge it, blast it and muck it out with trucks. It's taken away to be crushed into a concentrate that contains the gold. It has taken two years to reach the present point in the mine's development. The main tunnel is more than a kilometre long while more tunnels branch off it and follow the vein on three levels. The gold vein itself, and others nearby, are hundreds of kilometres long. They start in Scotland, go through Northern Ireland and then into Canada. They were once joined up, apparently, when these countries were part of a single giant continent.

The gold at Coronish is comparatively dense with about 10g per tonne of rock. That may sound like searching for a needle in a haystack, but for gold miners, that amount of gold could make this mine very profitable.

Below the mine entrance, a long low green warehouse is tucked in to the side of the mountain. It's insulated for sound – a strict rule, as this site is in a National Park. Inside, it's noisy. Tonnes of rock, brought up from the mine, are tumbling through a series of huge grinders. A massive metal drum spins like a tumble dryer, separating waste rock from gold flakes. The rubble flows along conveyor belts.

What's left looks like wet stony sand. This is as close to gold as they will get. Almost all of this material is sent abroad for refining.

The gold price has gone up in recent years and the workforce here has grown from 15 to 100 over the past two years. They're preparing for a new phase in production. Retreat stoping is an extraction method which achieves more productivity.

Tonnes of rubble flow along conveyor belts in the processing plant

"More ounces of gold in a more controlled and better format," he explains. The current gold output is 2,000 ounces per month with a predicted life of nine years left in this mine. But with the potential for secondary gold veins, in parallel to the ones already found, the company hopes to extend this life and even double it.

The area that we have stretches to the west just south of Oban, down Campbeltown way, and continues through to Loch Tay. The company has 2,900 sq km of area that we can explore. Currently Scotgold Resources are required to spread this rock into the contours of the hillside, then cover it with peat, soil, and plants – in short, to restore the land entirely. But there's bound to be concern voiced by local and environmental groups, if and when applications are made for new mines.

Gold mining on this scale may seem outlandish. But at £1,500 per ounce, it's too tempting a prospect for some to ignore. Most of the gold produced at the Cononish mine is sold abroad.

SOURCE: *BBC News Scotland,* 30 January 2023

Welsh Slate expansion creates 29 new jobs

Welsh Slate is expanding its operations at Penrhyn quarry near Bethesda, Gwynedd, and reopening two quarries in Blaenau Ffestiniog. They currently export 40% of their

roofing slate to Australia, and need to expand to keep up with the market demand.

It will mean 29 new jobs in a part of Wales where slate has been at big employer since the 13th century, when roofing slate was first quarried there. Plans to extract 250,000 tonnes of Penrhyn purple slate were approved in November 2022, extending the life of the quarry to the end of 2035.

Ten of the new jobs will be at Penrhyn, which already employs 115 people. The remaining 19 jobs will be at the Ffestiniog and Cwt-y-Bugail quarries, near Blaenau Ffestiniog, which reopened at the end of January alter being closed for more than a decade. Welsh Slate operates an industrial minerals plant in Blaenau Ffestiniog. The slate will be processed at Penrhyn and Cwt-y-Bugail, another slate quarry with a production history going back to 1840.

The Cwt-y-Bugail slate quarry has been producing slates from 1840, and is currently the highest industrial site in the UK. During World War II, many of Britain's most valuable paintings were secretly stored in its (Manod Quarry) caverns

Ffestiniog slates are a dark blue-grey, made unique by occasional white veins. For hundreds of years Welsh quarries have produced heather (purple) or blue-grey slate, considered by many to be the best natural slate in the world.

Slate is currently extracted from Penrhyn quarry by blasting. That means just 3% of the material is flat and uniform enough to be sold as roofing tiles. When the quarry is expanded Welsh Slate are potentially looking to use other methods of extraction like wire sawing. They estimate this could increase the yield of the quarry from 3% to 6%, if not more. That could double the life of the quarry or enable them to produce more slates.

The colour in the slate comes from any minerals that were present in the rock, usually iron. Ferrous compounds give the slate a reddish colour, whereas ferric compounds give the slate a green colour.

SOURCE: *Below* – The Journal of the Shropshire Caving and Mining Club, Spring 2023

NEWS – MISCELLANEOUS

Gallery's feeling flush over its new £3 million space

£3 million for a toilet might seem steep but that's what the National Portrait Gallery has spent buying a neighbouring former Victorian WC. The lavatory, on Charing Cross Road, closed in the Seventies and later became a West End ticket kiosk before falling into disuse. There may be 1,500 sq ft of exhibition space in the cubicles underground.

The Gallery is currently closed for renovation and plans to reopen this summer. Work on the ex-lavatory will happen more slowly. The £3 million was donated by Ukrainian-born billionaire Len Blavatnik, who gave a total of £10 million and will have a wing named after him.

Blavatnik made his fortune in aluminium in the former USSR. He now owns most of Warner Group and has a huge home in Kensington Palace gardens.

SOURCE: *Evening Standard*, 3 January 2023

Ancient crypt discovered beneath vape shop in Maidstone

The chamber, believed to date back to the 14th century, is thought to have housed corpses and coffins underneath a priory that researchers say once stood in Maidstone High Street in 1331. The crypt is only accessible via a trap door within e-cigarette store Evapo. Store manager Sam Jessop unearthed the stone chamber after venturing to the basement of the shop to take a gas reading.

History researcher Simon White believes the crypt may have been part of a Franciscan priory

History researcher Simon White said the "spooky and atmospheric" crypt was a great surprise. Mr White is encouraging anyone with information about Maidstone's history to come forward, in an attempt to unlock the town's cryptic past.

SOURCE: *BBC News Kent,* 21 February 2023

Extinct bat in the UK could be breeding in Sussex

In 2022 it was reported that a greater mouse-eared bat (*Myotis myotis*) nicknamed "Lonely Joe" was found at Christmas 2021 in a West Sussex rail tunnel by the Sussex Bat Group. Environmentalists had previously declared the species extinct in Britain, saying it was the first mammal to disappear in the country since the wolf.

However, "Lonely Joe" was initially found in 2002 and it was believed that he had been born that year. He was inspected once in 2007 and found to be in good health. For many winters, he had been hibernating in the same disused tunnel in Sussex, but disappeared in 2019, before appearing in 2021.

Now a second greater mouse-eared bat has been discovered in the same tunnel. It is believed that the newly found bat had crossed the Channel from France, where there is an established population. The species exists throughout the continent and are known to fly over 300km between roosts. Could there be a small pioneer population of greater mouse-eared bats recolonising Sussex and the Sussex Bat Group have yet to find where they are breeding?

Greater mouse-eared bats can live for up to 35 years. They are one of Europe's largest bats weighing about 45 grams and measuring 8 to 9cm head to tail, with a wingspan up to 40 or 50cm.

SOURCE: *Bat Conservation Trust News*, 20 January 2023

Proposal to turn Holford ROC Post in Somerset into a holiday home

A bunker built at the height of the Cold War between the West and the Soviet Union could be turned into a West Somerset holiday home.

The Royal Observer Corps bunker sunk into the top of a hill in Kilton, Holford, was one of 1,500 built across the country at the time and was used for monitoring in case of an attack on the UK. Now, owner Neil McCallum, of Kilton Farm East, Holford, wants to convert it to a small holiday retreat by exposing two sides of the bunker and extending it. His agent Michael Shepherd, of Shattock Associates, said: "This bunker will be used as a retreat by the applicant but will also be available to rent by like-minded holidaymakers."

Photo Nick Catford

The current use of the structure was described as a 'place of refuge'. Mr Shepherd said the site was near the West Somerset coast and on the edge of the Quantock Hills, making it a popular location for the target audience of walkers and cyclists. He said the site at about one-third of an acre was small and could only accommodate one car and was therefore not suitable for business premises but did suit holiday/leisure use, for which there was a demand.

The inspiration for the conversion was the famous Vista building, in Dungeness, on the South coast, a 1950s fishing hut converted by architect Simon Condor to a similar coastal retreat as planned for Holford. It would have a small shower room and a bed/sitting room with two single fold-down beds similar to those in a cross-Channel ferry cabin, while a small extension would house a kitchen and dining area.

Mr Shepherd expected the property would mainly be used in the summer, and electricity would be provided by solar panels with a battery back-up facility. Water for cooking and drinking would need to be delivered to the site but water for washing would be supplied by a rainwater harvest tank.

SOURCE: *West Somerset Free Press,* 16 December 2022

Derbyshire ROC Post on the market for £70,000

An underground nuclear bunker nestled 12ft deep in the Derbyshire countryside is on sale for £70,000. It boasts two rooms and is built of reinforced concrete to withstand an attack. Observer Post Field is located in Whitwell, Bolsover, Derbyshire, and would appear to the naked eye to be a bog-standard farmer's field used by its current owner to grow crops.

It is made up of two different lots. The first, spanning approximately 21.55 acres and valued at £280,000, is where the owner has kept his crops in recent years.

The second lot is worth £70,000, bringing the total price of the farmland to £350,000. That portion comprises a 4.61 acre section that includes the Cold War shelter. Derbyshire County Council has registered the bunker – which has been sealed – as a monument.

Photo Nick Catford

The authority's website states: "This site has been utilised over the past century and a half for its good vantage point. According to the Whitwell Local History Group, it was used as an observation point by the Royal Observer Corps from 1939 onwards and was manned every day during World War Two for this purpose.

"An underground shelter was built on the site, possibly in the 1970s [*wrong*: it was built in 1959], in the event of a nuclear attack. Inside the shelter are two rooms: a communal area and a w/c. A total of 870 [*wrong*: there were 1563] thermo-nuclear fallout shelters and observation posts were built throughout the country by the Home Office as part of a strategic defence against nuclear attack."

SOURCE: *Daily Star,* 30 January 2023

Victorian bear pit in Leeds to reopen

A derelict 1840s West Yorkshire bear pit could open again – complete with a bear statue – by the end of 2023. The bear pit on Cardigan Road in Headingley, Leeds, was once part of Leeds Zoological and Botanical Gardens.

The attraction was open for less than a decade due to financial problems, with the pit, which once housed a brown bear, becoming neglected and overgrown. Leeds Civic Trust now hopes to restore and open the structure again as a public space for the city.

The charity, which was given ownership of the listed bear pit in a will in the 1960s, said it was looking at spending about £100,000 on the restoration work. A ramp will take visitors up to the top of the attraction, with railings installed around the pit.

Bear pits became popular in England in the Victorian era as interest in exotic animals grew and crowds flocked to see something new, with a similar pit still standing in the botanical gardens in Sheffield, South Yorkshire.

SOURCE: *BBC News Leeds and West Yorkshire*

Stithians system of heating to be trialled in Cornwall

The low carbon network in Cornwall has been described as a blueprint which could be used across the UK to help reduce carbon emissions. The system in Stithians, Cornwall, is an alternative to gas, with homes being connected and each having their own ground source heat pumps. Cornwall-based firm Kensa claimed the shared ground array was a global first.

The pumps are expected to reduce heating bills for people by up to two thirds

The ground source heat pumps are expected to provide 100% of the properties' heating and hot water, meaning that residents will no longer use carbon intensive oil or LPG fossil fuels. The installation of the system, which costs £20,000 per household, is being paid for with European funding and will eventually cover 250 homes.

Kensa said the ground source heat pumps would reduce the carbon output associated with heating each home by around 70%. Kensa hopes that this infrastructure will eventually take the place of the UK's gas network.

SOURCE: *BBC News,* Cornwall 23.9.2023

NEWS – PUBLICATIONS AND BOOK REVIEWS

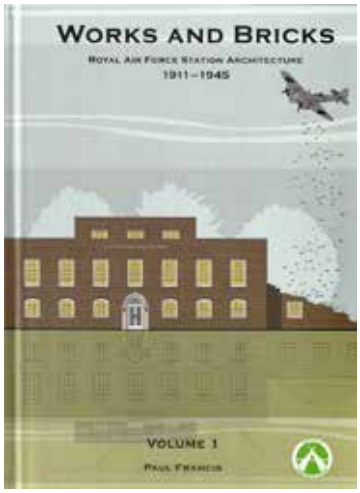
Works and Bricks: Royal Air Force Station Architecture 1911–1945 (Volume 1)

FRANCIS, Paul, 2023, Airfield Research Group, 286pp, £38 * ISBN: 9781-83821-330-5

Book Review by Martin Dixon

The Airfield Research Group will be known to many members and shares a similar history to Sub Brit. Founded as an informal group in 1977 the group is now a registered charity and a recognised authority on the history of airfields (in particular military sites). They hold a large archive at Alconbury and founder member Paul Francis has used this and other largely primary sources to produce this fine volume.

Paul wrote an earlier book *Military Airfield Architecture*, published 26 years ago which although long out-of-print, is still sought after. Paul's aim is to provide a much extended and updated publication over a number of volumes, of which this is the first. The title is slightly odd, *Works and Bricks* being reasonably obscure (to me) service slang for the Air Ministry Works Department. But, to paraphrase, you shouldn't judge a book by its title.



The book has three elements, linked but essentially independent. The first section gives a history of the development of military airfields across the UK, ending at the conclusion of World War II. The political background is covered, as well as the changing need as aircraft size and the threat of war increased. Part two covers a relatively small selection of specific building types, namely hutting, barrage balloon depots and air-raid shelters. Part three is a series of appendices, covering specific topics, some of them not directly related to airfield architecture. Topics covered here include 'Temporary Office Buildings', 'Alton 1920-1940' and 'Smith-Barry and the Gosport Doctrine'.

From a Sub Brit perspective, the section on air-raid shelters and the extensive appendix on the air-raid precautions at the Bristol Aeroplane Factory in Filton will be the main attraction. Lots of members of course have interests that also extend above (and even over) ground and will be fascinated by much of the rest of contents. Personally I would have favoured a structure that separated history, architecture and oddments into separate volumes but the chosen approach is perhaps more pragmatic and has something for everyone.

The sheer variety of building types is astounding - things you might expect like hangars and barracks and others less obvious such as bomb dropping towers and cinemas. RAF Cinemas were branded *Astra*, which reminded me of the popular translation of the RAF motto *per ardua ad astra* as 'after work, go to the cinema'.

Examples of buildings are well illustrated with both photographs and sectional plans; sadly the number of still extant structures reduces each year. There are also many airfield plans which show the sheer size, common factors and differences in the layout of airfields. Today's debate about whether to build a road tunnel at Stonehenge and its effect on the local archaeology is somewhat put into perspective by the plan showing RAF Stonehenge which extended right up to the monument itself. Tables help to show the scale and growth in RAF infrastructure.

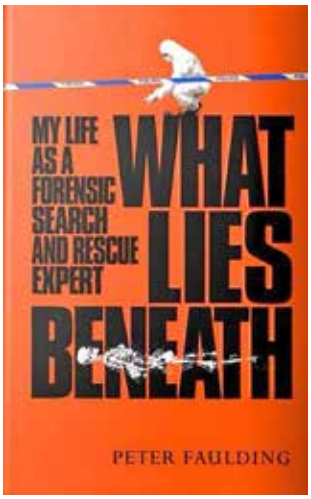
The book has a useful glossary and there are nice clear endnotes by chapter. There is no index which is a bit of a shame – perhaps one could be incorporated into the final volume. A map of the many sites featured would also be useful. There are a few tiny presentation issues – for example the decode of one plan reads 'key to plan opposite' which is in fact overleaf; and the contents for the hutting section are slightly out of place.

But these are minor points and ARG and Paul are to be congratulated for making their archive and other records accessible to so many in this way. The book is helpful as a reference book for enthusiasts, historians and modellers but the variety within makes it a good read from cover to cover. I look forward to future volumes, in particular on watch offices/control towers which have always been a personal favourite.

The book can be ordered via the ARG website at https://www.airfieldresearchgroup.org.uk/shop/arg-store/books/works-and-bricks

* ARG has generously agreed to give Sub Brit members a £5 discount on the published price and this can be obtained by adding the code **SBWorksVol1** at "Step 5 Payment Method" during the online checkout process. There is no need to register on the website, check out as "Guest". Any queries can be directed to John Gilby, on visits@airfieldresearchgroup.org.uk. Anyone wishing to purchase the book from outside the UK is welcome to contact ARG to discuss payment and delivery costs.

WHAT LIES BENEATH – My life as a forensic search and rescue expert



FAULDING, Peter, 2023, Pan Macmillan, 294pp, £18.99 ISBN 9781-03500-590-1

Book Review by Phil Catling

Peter Faulding will be a familiar face to many of the Subbrit family, after speaking at our 2023 Spring meeting on his underground experiences.

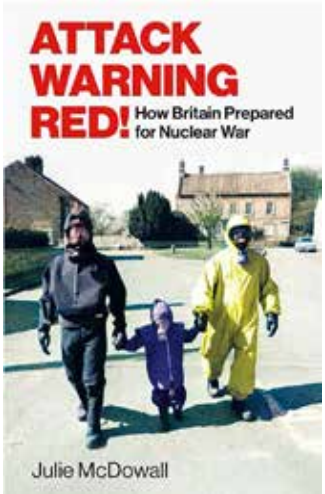
This book is a delight for anyone with an underground interest, as Peter has spent his life in caves, tunnels, cellars, wells and rivers. Starting when a small child, exploring and opening sections of the disused mine networks of Merstham in Surrey, Peter describes life with the Parachute Regiment, air ambulance, and then drifting into search and rescue, specialising in confined spaces.

After a successful few years in the 1990s training students in confined spaces access and rescue, Peter progressed to removing eco-warriors like Swampy from makeshift tunnels deep under nature reserves, the Honiton bypass, Manchester airport and Euston station.

Since he set up Specialist Group International in 1995, the company has become the leading search and recovery outfit for confined spaces, water losses and, interestingly, 'no body murder cases' where a murder is known to have happened but no remains have yet been discovered. SGI went on to work on high profile murders, disappearances, and even assisted in hunting for the lost remains of serial killer Peter Tobin.

The book is written in a thrilling, adventure story style but pulls no punches with the seriousness of the cases Peter and his team investigate. Full of underground content, the book especially piques the Sub Brit interest when it shines a light on previously under-reported areas like the protest tunnels of the 1990s, and the use of ground penetrating radar, drones and underwater cameras in the search of flooded and disused mine shafts for crucial evidence.

ATTACK WARNING RED! How Britain Prepared for Nuclear War



McDOWALL, Julie, 2023, Bodley Head, 256pp, £22.00
ISBN: 9781-84792-621-0

Book Review by Phil Catling

Anyone who has encountered Julie's fantastic *Atomic hobo* podcast or thrilled to her detailed examination of the 1984 classic *Threads* in four-minute chunks will have been waiting with bated breath for this book.

The detailed story of the 'home front' in Cold War Britain, the book covers a wide variety of areas across society and life under the threat of the mushroom cloud. Written in an engaging and readable style, Julie's book has brought detailed research to the human experiences of the period, with true stories, real characters and genuine people jumping from the pages.

Including in-depth looks at social and popular culture aspects of the time, such as film, TV and pop songs, Julie also describes her visits and reactions to surviving Cold War monuments, like an ROC post and Hack Green ROTOR bunker. Post-attack preparations are discussed in detail, along with the arguments for and against shelters for the civilian population, evacuation and post-atomic war medical care.

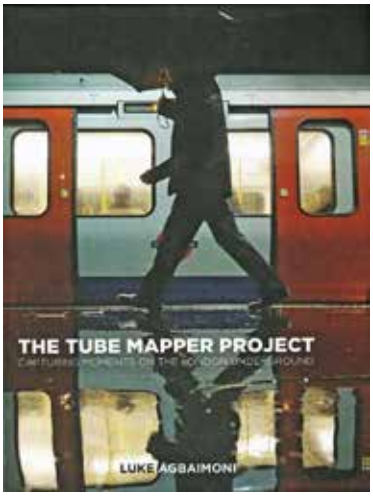
The Protect and Survive programme is examined in depth and eviscerated with a sharp eye for the farce it would have become in the case of a real attack. Julie brings her distinctive and engaging voice to the page and the book finds lots of humour among the myriad absurdities of civil resilience, especially in a close look at a typical Easingwold training course.

Civil Defence volunteers are treated with sympathy and respect, and the shock of the fall of the Berlin Wall and an unexpected 'stand down' is described very well.

This is a fascinating and excellent book on a wide topic, and Julie's podcast style translates very well to the written word. As an introduction to the topic and historical era, it is a gem, with new and interesting diversions and stories in every chapter, that had me reaching for Google to find out more.

ATTACK WARNING RED! is a must-buy for anyone interested in the Cold War, Civil Defence or the public reaction to four decades of fear and stress in the new atomic world.

The Tube Mapper Project



AGBAIMONI, Luke, 2020, The History Press, 224pp, £20. ISBN: 9780-75099-437-8

Book review by Martin Dixon

Luke Agbaimoni took a degree in graphic design and worked as a designer in London's Docklands. Whilst here he started photographing the locality and entered a TfL competition for photographs of the DLR. Luke

won the competition and the first prize of a camera. This catalysed a new focus on his photographing London's Tube Network and this book (which also includes the DLR and London Overground) is the result.

The format of the book is to group images around seven themes such as Reflections, Symmetry, Spirals and Waiting for Trains. Many of the photos are taken at dusk or night and include lots that feature rolling stock – sometimes blurred as a result of long exposures. It is definitely an art book rather than a transport historian's record of station architecture and artefacts. Each of the photos is helpfully augmented by a location and single sentence description. There are also a small number of short poems (from other contributors) that complement the images.

Overall I really like the photos, mainly as they are different from many images taken by Sub Brit members. Most of us prefer photos that feature only the built environment and people in shot are studiously avoided. Luke, by contrast, seeks out passengers and movement – each shot of a single moment suggesting a story. Why is one person stationary among a sea of movement? Were the two people pictured together a couple or strangers? Even the closing tube train doors invite a story.

Many hours must have been spent waiting or setting up the desired shot – looking for the perfect puddle to capture a particular reflection, the exact alignment of two adjacent trains or the mix of passengers to complement or contrast with the background. The low-light photography is especially impressive given the TfL ban on the use of tripods or flash, although image stabilization technology no doubt played a part.

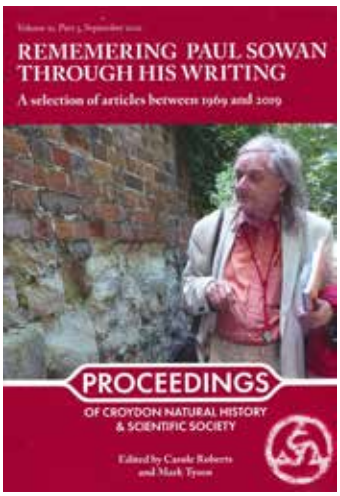
From my perspective there is a little too much repetition – particularly of moving trains. These blurred images do of course effectively indicate movement but arguably don't encourage a prolonged examination that in-focus images do. Nearly all of the passengers are shown from behind; helpful in terms of personal privacy but losing the opportunity to convey the emotions and motivations of travellers on the network.

By contrast, I would have enjoyed more images featuring tile work, signs and maps – some of the most fascinating aspects of the built environment. Most of the photos are quite wide-angle; a few close-up images would have given more variety. The thanks at the end of the volume extends to around 400 names – it's not clear whether these include strangers featured or those who helped more actively but it's nice to think that the wonders of the tube network can also help build friendships and relationships.

Perhaps my biggest criticism is that the format of the book places the majority of images across a two-page spread, with the result that the central portion cannot be fully appreciated without forcing the book open and risking the binding. Smaller images would have lost lots of the impact but a larger-format book would have been a great improvement.

Luke has certainly added to the canon of books of underground photography with this fine volume. I discovered while compiling the review that a second volume – *London Underground Symmetry and Imperfections* – has just been published, so Luke's goal of capturing scenes at 272 London Underground, 113 Overground and 45 Docklands Light Railway stations is one step nearer.

Remembering Paul Sowan through his Writing



SOWAN, Paul Wenning; edited by Carole Roberts and Mark Tyson, 2022, CNHSS, 44pp, £6.95.
ISBN: 9780-90604-735-4

Book Review by Martin Dixon

Paul Sowan, Sub Brit's Chairman for over twenty years, sadly died in 2021. Paul was a member of around a hundred different societies and clubs. Of these, his attentions were chiefly occupied by Subterranea Britannica and the Croydon Natural History and Scientific Society (CNHSS). Paul served as Company Secretary for CNHSS and twice as President; he was still active as its Honorary Librarian at his death. CNHSS has recently published a splendid tribute to Paul, being a collection of many of his articles from across the years.

The volume has been published as a special *Proceedings of CNHSS* and includes articles dating from a fifty-year period from 1969 to 2019. The articles selected are mostly on topics with a link to Croydon and the surrounding area. Within this brief, the vast breadth of Paul's interests and knowledge is revealed, ranging from slugs and snails (the earliest article featured) to the architecture of orangeries (the most recent).

Many articles of course reflect Paul's passion for matters underground – in particular stone quarries, railway tunnels, geology and bats. Most of the pieces were originally published by CNHSS but three came (with permission of course) from *Subterranea*; others come from the Bourne Society, Wealden Cave and Mine Society and the Croham Valley Residents' Association.

Anyone who knows Paul's work will appreciate that his articles rarely needed sub-editing but the different styles of the original journals (for example in fonts, use

of italics or date format) has been helpfully brought together to a common style. It seems this attention to detail didn't extend to proofreading the cover, where a splendid photo of Paul is somewhat marred by an unfortunate misspelling. There are around twenty other photographs, including half a dozen well-chosen ones of Paul himself at various stages of his life.

A less expected piece is Paul's obituary of his own father – from whom Paul obviously inherited some of his passions (technical writing and vegetarianism to name just a couple). Unlike Paul, however, his father's claimed highest academic achievement was the Boy Scouts' Electrician's Badge! Most of the articles include sources and/or references, the omission of which in others' work sometimes caused Paul some annoyance.

All in all the volume is a delightful wander through Paul's vast interests and the approach ranges from academic research to the simply quirky. It brought back happy memories of sharing many pints with Paul, where topics of conversation always ranged similarly widely.

Congratulations to CNHSS and in particular to the joint editors Carole Roberts and Mark Tyson for assembling this great celebration of Paul and his works. Interested Sub Brit members can purchase the volume from CNHSS via sales@cnhss.co.uk for £6.95 plus £2 p&p.

NEWS – TRANSPORT

Axe hangs over Stonehenge tunnel and big roads projects

Motorists could miss out on crucial traffic-cutting projects as the Government looks set to cancel and delay schemes to save money. The £2.4 billion Stonehenge tunnel and £9 billion Lower Thames Crossing between Kent and Essex could both be affected (see another news item below).

Dame Bernadette Kelly, the Department of Transport's top civil servant, told MPs in parliament yesterday that there was "little financial headroom" for large roads projects until 2030, due to inflationary pressures and other funding commitments. Investment plans for the country's strategic roads cover five-year periods, with the current programme, RIS2, set to end in 2025.

The next, RIS3, is in planning stages, but Dame Bernadette indicated that several of its 32 schemes, which are aimed at easing congestion and improving access, may not go ahead.

These include upgrading of the A2 Dover access road, improvements to motorways on the east side of the Severn Crossing, and works to cut congestion on the A5 and the M69 between Hinckley and Tamworth. The A303 tunnel under Stonehenge has been hit by delays and cost overruns.

SOURCE: *Daily Telegraph*, 2 February 2023

Almost half of London has travelled on the Elizabeth line

Nearly half of Londoners have used the Elizabeth line since it opened in May, a new survey revealed today. The results of a YouGov poll indicate that 45 percent of the capital's residents have made at least one journey on the £19billion railway.

The latest survey – conducted in late January – suggested that people aged 18–24 are most likely to have used it (53 percent). The proportion of users who said they took a special trip to see what the railway was like has fallen from 37 percent in July 2022 to 25 percent, suggesting it has become more a part of people's daily lives.

SOURCE: *Evening Standard*, 20 February 2023

New video of South Kentish Town closed tube station

South Kentish Town opened with the Charing Cross, Euston & Hampstead Railway on 22 June 1907. The entrance building was designed by Leslie Green with the characteristic red glazed terracotta elevations typical of all the stations he designed for the CCE&HR. From there the main passenger access was by two lifts within a single 23ft diameter shaft down to the platforms fifty feet below; there was also an emergency spiral staircase in an 18ft diameter shaft.

The original name for the station was Castle Road and this appeared on the station tiling and on several maps prior to opening. Before the station opened the name was changed to South Kentish Town and a recent investigation showed that the tiles showing Castle Road were then painted over. The station was never well used and from July 1908 some trains didn't stop at South Kentish Town.

Lower lift landing at South Kentish Town. Photo Nick Catford

The station was temporarily closed following unofficial strike action at the Lots Road power station during the afternoon of 5 June 1924, trains having called at the station that morning. Once power was restored it was decided not to reopen Mornington Crescent and South Kentish Town. Mornington Crescent was eventually reopened on 2 July but South Kentish Town remained closed due to very low passenger use.

As with City Road, South Kentish Town was adapted as an air-raid shelter during WWII and was equipped with bunks and a first-aid post in 1940; these were removed immediately after the war. The platforms have also been demolished but there is no record of when this happened.

There have been several proposals to reopen the station but these have come to nothing and the station is now retained for emergency egress from the Northern line and an access point for permanent-way works. The station building has been let to a number of retailers over the years and is presently a branch of Cash Converters who have access to the upper lift landing.

A new 30-minute video made by the London Transport Museum has recently been published. You can see the video on YouTube:
www.youtube.com/watch?v=bCPN77zBG2s

SOURCE: London Transport Museum website

NEWS – TUNNELS AND TUNNELLING

Napoleonic vaults and tunnel in Chatham due to be auctioned

You could use it for storage, or perhaps as the base of a new business – or simply as part of a military complex to help defend yourself against the French…

This array of vaults and tunnels off Manor Road, Chatham, thought to have been built in the early 19th century during the Napoleonic Wars, was due to go up for sale with auctioneers Clive Emson in March, with a guide price of £100,000 to £105,000.

SOURCE: *KentOnline,* 25 January 2023

New Tower Subway video

Vodafone, who now own the Thames Subway tunnel in London, have posted a short video on their website.

The Tower Subway is a tunnel dug under the Thames in 1869/70 just to the west of the Tower of London, and was initially intended to be a railway tunnel linking either side of the river. In fact, the railway was a dud, and the tunnel was quickly repurposed into a pedestrian tunnel, which was hugely successful. Until they stuck Tower Bridge next door, and all the pedestrians switched to the bridge. The tunnel closed to the public in 1898, but it's still in use, for utilities.

Initially, it was used to pump high-pressure water from steam engines on the south side to the north, for use by the London Hydraulic Power Company (LHPC). They had run a large network of largely forgotten pipes under the streets of the City that provided high-pressure water to offices. This wasn't for drinking, but was for power – to move hydraulic cargo lifts and the like. In the days before electricity, London ran on high-pressure water.

Photo Callum Cromwell

Of course, electricity killed off the need for hydraulic water, although it took until 1977 for the company to close completely. However, it left a legacy – all those small pipes running under the City of London, and something very useful at the time when such things were hard to get, the legal powers to dig up roads.

In 1982, a group of investors bought the defunct company along with the Thames Subway tunnel as they realised that if British Telecom lost its monopoly in the UK (as it was to), then one of the new companies would want to deploy a lot of fibre optic telecoms cables across London.

So it was that in 1985, Mercury Communications – owned by Cable & Wireless – was able to buy the company, and used all those Victorian water pipes to lay its fibre optic cables in. And they used the Thames Subway tunnel to link the north and south sides of the Thames with telecoms links. And they still do – although these days Cable & Wireless is owned by Vodafone.

You can see the video on YouTube:
www.youtube.com/watch?v=aY11tctPOnw

SOURCE: *Ian Visits* website, 16 March 2023

First Silvertown road tunnel bore completed, London

The 1.1km long tunnel has been dug from the north to the south, by a giant tunnel boring machine, named in honour of Jill Viner, the first female bus driver in London.

Aside from a small section around the tunnel entrances,

which will be built using a 'cut and cover' technique, the two bores that make up the Silvertown Tunnel are being built using one 82 metre-long, 11.9 metre-diameter TBM. The TBM averaged around 18 metres a day during the delivery of the first bore as it worked its way under the river from Newham to Greenwich.

The conveyor system, built to remove excavated materials, has helped transport around 275,000 tonnes of spoil from the tunnel via barge as well as spoil from the retrieval chamber of the TBM and other civil works within the Newham site.

Having arrived at Greenwich, the TBM will now be rotated around in pieces within a 40m rotation chamber, before beginning its 1.1km journey back under the river to the Silvertown site in Newham in the coming months. The process will involve sections of the TBM being placed on 'nitrogen skates' within the rotation chamber and turned around before boring the second tunnel. This is a highly innovative and complex process, where the individual sections of the TBM, including the 1200-ton cutting shield, will be spun 180 degrees inside a shaft and then reassembled and reconfigured to facilitate tunnelling the second bore back to Newham.

Once tunnelling recommences, spoil from the second tunnel will be fed back via the conveyor systems installed within the first tunnel to allow it also to be removed by barge from the Newham site. The second bore is expected to be completed by the end of this summer.

Once open, the twin-bore 1.4km Silvertown Tunnel will link Newham to the Greenwich Peninsula and provide improved bus links across the Thames.

SOURCE: *Ian Visits* website, 27 February 2023

200 mile ultra-marathon in a tunnel

Do you put your feet up in front of the TV? Maybe shopping is your way to unwind? Perhaps you're a bit more adventurous and enjoy a stroll in the countryside? That doesn't quite cut it for some people, who choose to run a 200-mile ultra-marathon in a disused railway tunnel instead.

The Tunnel Ultra is a race like no other. It's easy to find longer events. Some even involve repeating the same loop for days on end. But nowhere else can you take part in a race so twisted that you spend more than two days in darkness doing a one-mile shuttle run 200 times, or so punishing that one runner went temporarily blind – then thanked the race organiser for the privilege. No outside support is permitted, headphones are banned and runners are not allowed to run side by side. Oh, and there is a strict time limit of 55 hours.

The race takes place in Combe Down Tunnel, a mile south of Bath city centre, and starts at 4pm on a Friday in March. No more than forty runners make it that far, partly because of a strict – and deliberately opaque – qualification process and largely because the tunnel is not big enough to accommodate many more. "Even the start line is weird," says Mauduit. "You have to stand one behind another in a queue."

Combe Down was restored as a cycle path in 2013 after 47 years under weeds. It is the UK's longest foot tunnel – and the obvious setting for an ultra-marathon. The race is low-key in the extreme. A fold-up table outside one end of the tunnel serves as race HQ.

There is no shelter or rest area to speak of unless runners have the foresight to bring a camping chair. They must all share a portable toilet which, by the end of the weekend, would not look out of place at a music festival. Refreshments are limited to water and tea, while the most luxurious snacks are Pot Noodles. If you're lucky, they might not be out of date.

SOURCE; *BBC Sport,* 17 January 2023

Lower Thames Crossing project delayed by two years

The planning and construction of the UK's longest road tunnel is being pushed back by two years, the transport secretary has announced.

Work on the Lower Thames Crossing project, linking Essex and Kent, was on course to begin in 2024 and be completed by 2029. However, Mark Harper said in early March that a two-year delay would help meet "inflationary pressures".

Mr Harper said: "This will allow more time to take into account stakeholder views and prepare an effective and deliverable plan, while helping to meet inflationary pressures and deliver the planning processes properly."

Proposals for the new 14-mile (23km) road – of which 2.6 miles (4.1km) would be underground – were accepted by the Planning Inspectorate in November and a government-appointed panel of experts was due to scrutinise the project. Mr Harper said £800m had already been spent on the scheme.

Thurrock Council in Essex has opposed the project, claiming it would "swallow up" 11 percent of its green belt land, and accused project manager National Highways of "not listening" to its concerns. A coalition of conservation groups said it could become "England's most damaging road scheme for a generation."

SOURCE: *BBC News Essex,* 9 March 2023

World's longest bicycle tunnel opened in Norway in April

The Fyllingsdalstunnelen is a tunnel cut through one of seven mountains surrounding Bergen. The 1.8-mile tunnel connects a residential area, Fyllingsdalen, with the centre of the southwest Norwegian city.

The tunnel, which opened on April 15, will take 10 minutes on a bicycle to get from end to end or up to 45 minutes if crossing on foot. While it sounds like a lot of time to spend in cramped confines underground, the transit will slash commute times. According to *Euronews*, the tunnel will cut a typical 40-minute journey down to a 25-minute trip.

The Fyllingsdalstunnelen has been built with safety and comfort in mind. The tunnel is well lit with colourful lighting fixtures, and its walls are beautifully decorated. There are also security cameras and an emergency phone every 800 metres. And if you're worried about continuously walking for 45 minutes, there are rest stops inside the tunnel. The entire length is also heated to 44 degrees, particularly important during Norway's winters.

The tunnel's construction was partly born out of a very unique opportunity. It was meant to serve as an emergency tunnel for a parallel light rail tunnel, but plans were expanded to allow for public use. The construction was funded by Bergen's state-supported Miljøløftet or Environmental Promise in English, agency. The organization hopes that the tunnel among other efforts would encourage more people to cycle or walk over driving, reducing emissions, pollution and traffic.

Fyllingsdalstunnelen is now the longest purpose-built cycling tunnel in the world. There is a longer tunnel in the United States, the Snoqualmie Tunnel. This two-mile tunnel outside of Seattle, Washington state, was built in 1914 for the Milwaukee Road, a defunct railroad. The tunnel was abandoned in 1980 and converted into a rail trail, not purpose-built.

SOURCE: *Jalopnik,* 16 March 2023

LATE NEWS

The VoBR Torpedo Wagon being restored

The Torpedo Wagon is a two axle 20 ton platform wagon, ordered in May 1940 for Royal Navy Propellant Factory (RNPF) Caerwent. Costing £595, it was purchased to carry torpedoes. RNPF wagon 7 was dimensioned as follows: length over headstocks 27ft, length over buffers 30ft, width over curb rails 8ft, height from rail to top of floor 4ft, tare weight 7 tons 14qtr. The GWR registration plate showed max load 20 tons.

Photo Roger Gosling

After use in RNPF, it was delivered in 1993 to the National Waterways Museum (Gloucester). It was fitted with nine-hole adjustable Morton brake gear suspended on simple V hangers with 'GLOUCESTER' embossed on the blocks and a painted note 'Do not use after 8-94'. ln 2009 the wagon was still next to the Museum and being used to support a 30ft horse drawn icebreaker boat on Cheshire canals, built in Victorian times, only being retired in the 1960s.

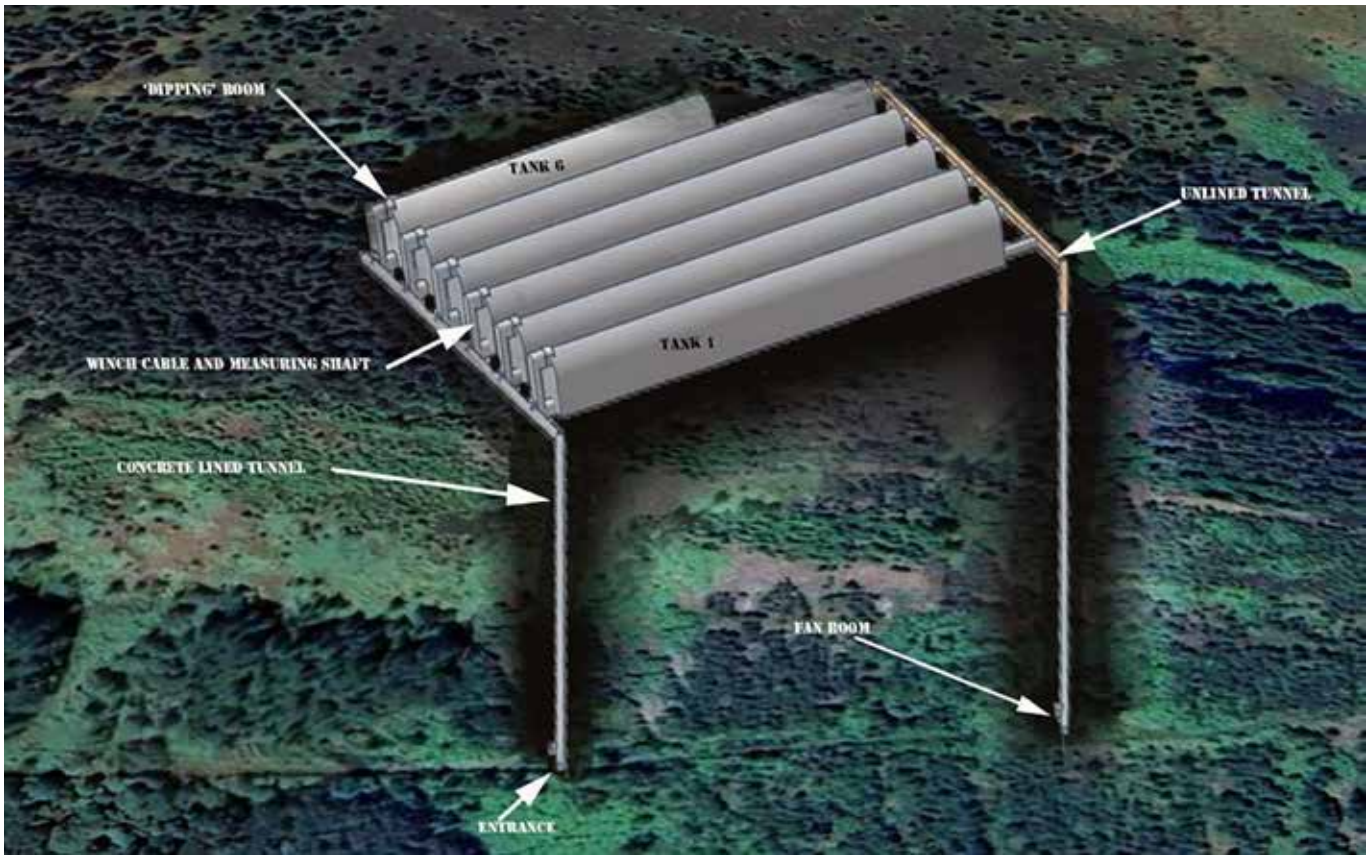
In 2020, the torpedo wagon was donated to the VoBR by the NWM and moved to Sharpness. It is hoped that refurbishment of the paintwork and replacement of most of the woodwork will begin early in 2023. It is, on first glance, in fairly good complete condition and so is clearly going to be quite useful for moving materials and equipment around on the VoBR sidings at Sharpness.

SOURCE: Vale of Berkeley Railway (VoBR) Newsletter 26 and Alan Price

Sub Brit Visit to the Inchindown Fuel Tanks

Tim Wellburn

Our Scottish study weekend in October 2022 included the possibility of a visit to the WWII underground fuel tanks at Invergordon naval base.



The arrangement of the six oil storage tanks and access tunnels within Kinrive Hill, Inchindown. Diagram by Dave Maguire; background Google Earth

Invergordon, a small town in Easter Ross, lies about 180 miles north of Edinburgh, but that was no deterrent to twenty Sub Britters who headed this far up into the Highlands to seize a rare opportunity to visit the Inchindown underground fuel tanks, and various related military sites of the Cromarty Firth.

A detailed – indeed, probably the definitive – description of the Inchindown installation can be found in *Subterranea* 24[1]. This was written by Allan Kilpatrick, an archaeological investigator for the (then) Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), who had visited the complex in September 2009. The colour photographic record of this investigation is available on Historic Scotland's Canmore website[2]. At the risk of replicating aspects of Allan's article, it may be helpful to reprise a little of the site's historical context.

Genesis

The Cromarty Firth had been adopted as a defended naval anchorage in 1913, based on the small port of

The Cromarty Firth, from Fyrish Hill, looking out across Invergordon towards the Sutors.

Invergordon, with gun batteries constructed on the Sutors, the headlands commanding the Firth's narrow entrance. The Royal Navy's transition from coal to furnace fuel oil necessitated the construction, during

and after WWI, of large fuel tank farms at Invergordon. These were surface installations.

Oil storage tanks at Invergordon, dating from WWI. These were built immediately north of the town centre: no enemy threat to them – or to the town's inhabitants – was envisaged at that time

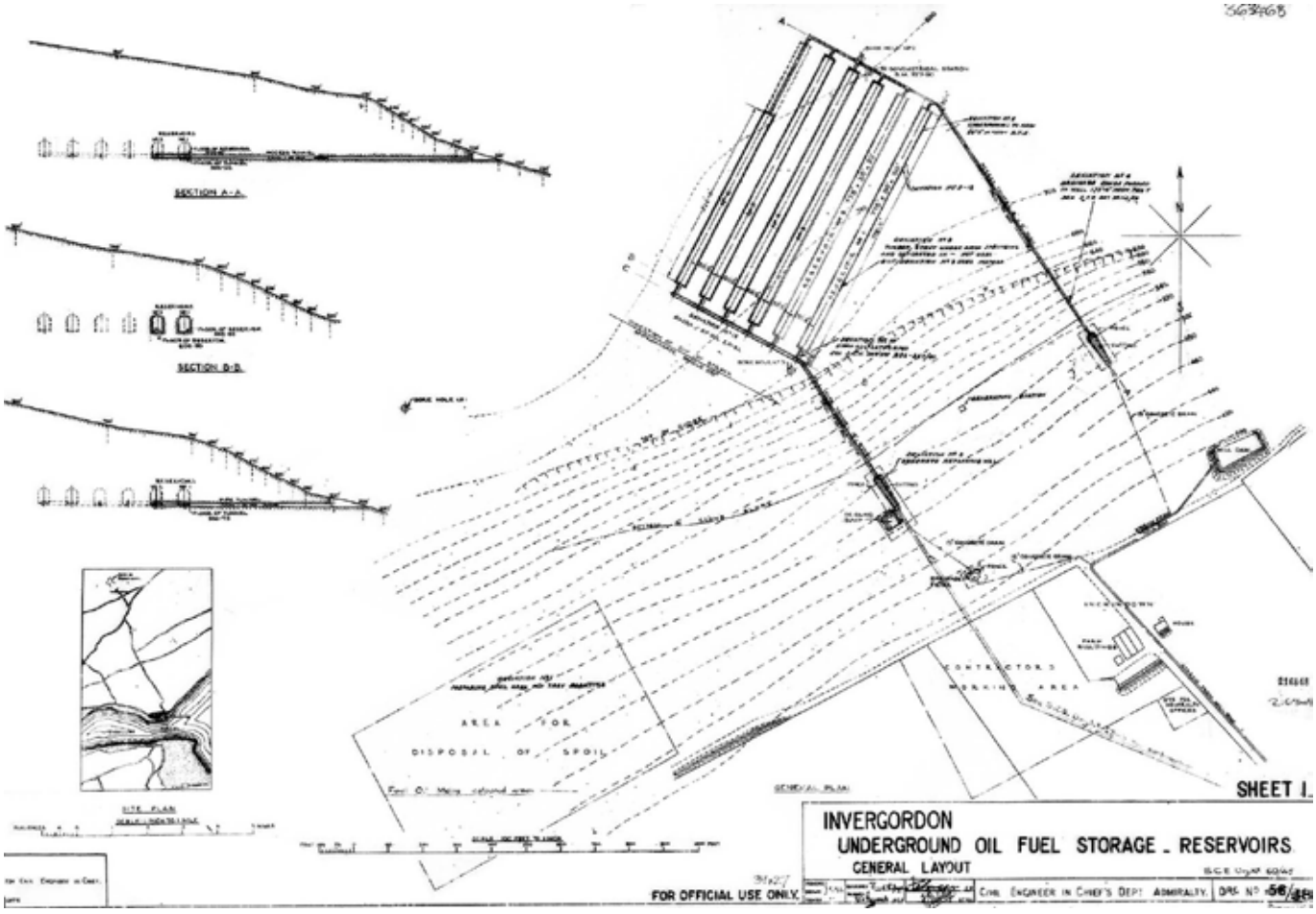
By 1937, given the likelihood of war – and of aerial bombardment – the Admiralty initiated a major programme to construct bomb-proof underground oil storage tanks. Major facilities were built at Portsmouth, Lyness (Scapa Flow) and Inchindown, with smaller ones at most other naval ports. (See *Subterranea* 37 for the late Chris Rayner's account of the Dover tanks[3]). Those at Inchindown were constructed between 1938-41, local geology dictating their location some four miles to the north of the naval facilities at Invergordon.

The layout

A common plan was used for the two Scottish underground oil storage facilities[4], each comprising six parallel tanks. Only the arrangement of the access tunnels differed, reflecting local topography. Five of the tanks measured 778ft long by 30ft wide and 45ft high (237m x 9m x 13.5m); the sixth was slightly shorter at 556ft (171m), but of similar width and height. The total capacity of the six tanks was 32 million gallons (or approximately 100,000 tons) of oil, although the sixth tank – at least at Inchindown – appears never to have been used.

Each tank has a fuel valve and related infrastructure at one end and provision for floor-level (inspection?) entry at the other. The main access gallery serves the tanks' valve chambers, and has two fuel supply pipes (as well as drainage and a ventilation duct) running underfoot. A separate, narrower gallery serves the other end of the tanks. This is the longer of the two tunnels because of the orientation of the tanks within the hillside and the dog-leg approach required to reach the far end of the shorter No.6 Tank.

The supply pipes, buried except where they cross streams, run between Inchindown and the Invergordon tank farm and dock. The oil was pumped up to the former, but flowed back down to sea level under gravity.



The Admiralty General Layout Plan of the "Invergordon Underground Oil Fuel Storage Reservoirs". Plan provided by David Cook and reproduced by permission of Heritage Environment Scotland

Furnace fuel oil is extremely viscous and has to be hot in order to flow.

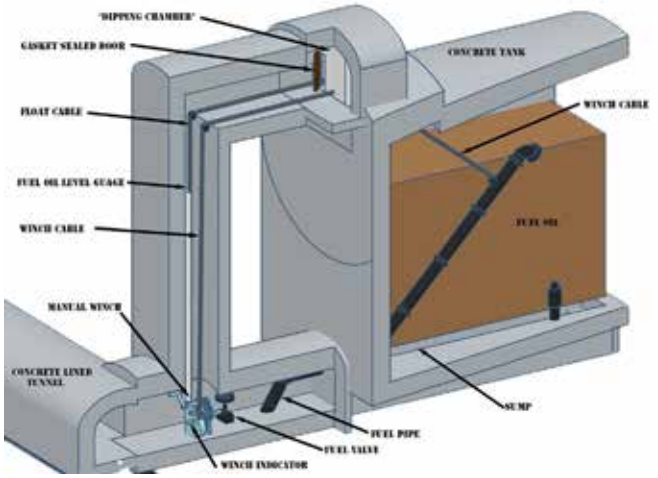
Oil heating facilities were provided at Invergordon, and en route by means of a series of electrical heaters. Heating pipes were also installed within the Inchindown tanks, but it is speculated that the enormous volume of oil held within these tanks may have remained hot enough to render further heating here unnecessary.

The entrance vestibule of the main access gallery leading to the oil tanks' valve chambers. The room to one side contains the ventilation fan. The twin supply pipes are beneath the floor and run from here to Invergordon, a distance of some four miles

We venture into the hillside

A 4x4 track led us up to the spoil tip where our guides, David Cook and Preston White, briefed us on the tanks and our visit. We donned hard hats, wellies and our almost ubiquitous disposable white overalls before ascending on foot to the portal of the main access gallery.

Once inside we inspected one of the supply pipe valves under a floor plate, and the set of four electric heaters provided to keep the oil here sufficiently heated to flow through the pipes. Some way further in, there was clear evidence of a former protective blast wall.



The oil supply end of the tank showing the adjacent valve chamber, access shaft and the winch arrangement for raising or lowering the internal oil supply pipe. Isometric diagram by Dave Maguire

The concrete-lined gallery runs straight into the hillside, at a slightly rising gradient to allow water drainage, heading towards No.1 Tank where it kinks 30^0 left to run a similar distance along the southern end of all six tanks. These are marked by doorways set in high corrugated iron shuttering, giving access to small chambers adjacent to the end wall of each tank.

Each chamber contains a winch and a large valve which controls the oil flow into or out of the tank. The supply pipe to/from this valve emerges from the floor of the chamber and disappears through the end wall. There is a second pipe flange, securely blanked off, set alongside it.

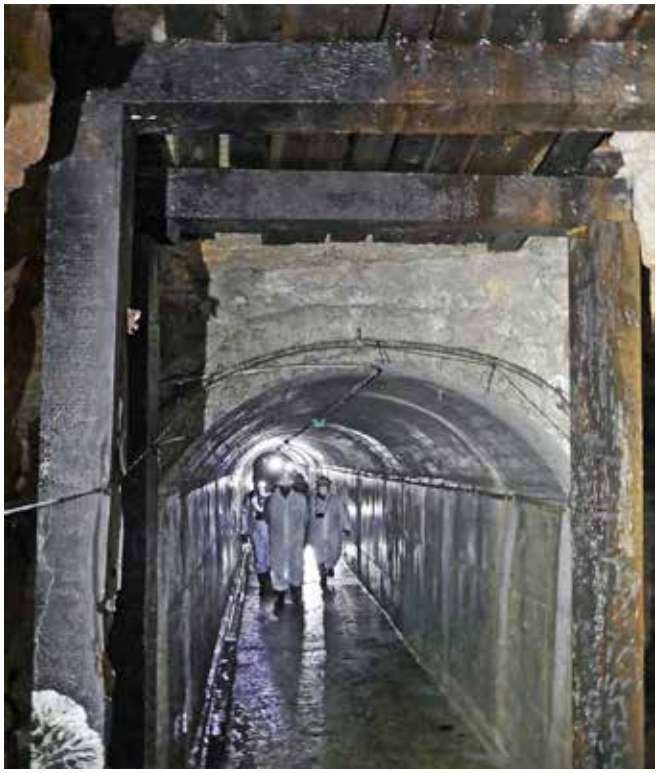
Inside one of the valve chambers abutting the end of a storage tank

The winch was used to elevate or lower a hinged extension of the supply pipe within the tank. Oil drawn off from the tank was taken from the top where it was hottest and least viscous. Above the winch is a vertical shaft, rising some 50ft.

The vertical ladder giving access to the upper chamber and top of the tank

The winch cable (where still extant) rises up this, as does an oil depth gauge and a vertiginous steel ladder, which we did *not* ascend. Had we done so, we would have reached another chamber which gives access, through a fume-proof door, to the inside of the top of the tank. Temperature readings could be taken from within this area.

Having examined this infrastructure, we back-tracked to the portal and skirted the hillside to the second, narrower access tunnel. This had similar traces of removed blast walls, and also retained some rather fine overhead brass electric lamps. A noticeably longer walk brought us to the point at which this gallery, too, kinked left in order to run behind the far end of the tanks. Just before this, it ceased to be concrete lined, in places the rock being supported by squared timber roof props.



The Sub Brit party reach the point at which the concrete lining of the easterly access tunnel gives way to rock – and timber roof props

We passed five alcoves, the end wall of each displaying the flanges of four pipes of about 18 inches diameter. Beyond the fifth alcove, the gallery turned 90^0 left and ran on for another 60 yards or so to reach the access chamber at the end of the shorter No.6 Tank. We did not enter this tank, which still retains its heating system in situ, but by inserting a torch in one pipe flange and one's head in another, it was possible to see the parallel runs of this, receding into the darkness of the tank.

Into the tank

It was now time to put our smart white overalls to use. No.1 Tank had a fine relief plaque inscribed FEBRUARY MCMXLI A.D. (the *Anno Domini* presumably avoiding any risk of mistaking these for Pharaonic works). It

The racking supporting the heating pipes within No.6 Tank

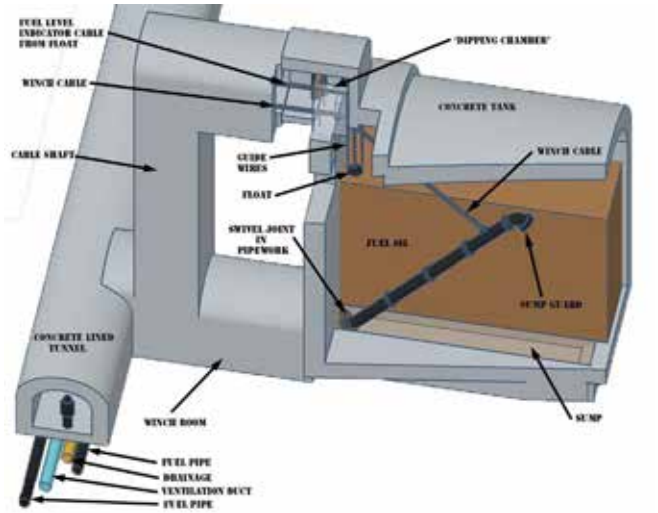
David Cook, leading by example, prepares to enter No.1 Tank; John Bray looks on in disbelief. Photo Clive Penfold

also sported a horizontal metal slide, manufactured by one of the guiding team out of an oil drum. On this lay an enormous long-handled paddle. Imagine an old-fashioned bread oven and peel. In this case, we were the loaves of bread and, by lying face down on the paddle and keeping one's head down, and all appendages tightly inboard, it was possible to be slid through the pipe to emerge feet-first into the oil tank.

David Cook had gone in ahead to field the bodies before they shot off into the oily depths, and John Coates did sterling work with the shovel despatching (and later retrieving) people, displaying remarkable stamina and sustained good humour in his work.

The vast interior space of the tank was an astonishing sight. The far end was visible only with all the lumens that massed Sub Britters could muster. Our guides seemed quite impressed: I don't think the tank had been illuminated like that since it was professionally photographed by RCAHMS in 2009.

The interior of No.1 Tank. When the tanks were cleaned, the heating system was dismantled and stacked against the walls. Photo Clive Penfold



The valve end of the tank, showing the sump, supply pipe and infrastructure associated with the upper chamber. Isometric diagram by Dave Maguire

Constructed of concrete, with an arched roof but a flat floor, the tank was evidently a more sophisticated structure than was visible. At intervals along the walls were vertical ribs, resembling pilasters, but also extending across and running longitudinally down the centre of the base of the tank. I think these covered water drains. Those on the floor provided convenient pathways, being largely clear of the inch or two of oily water sludge that has seeped out of the structure since the tanks were decommissioned and cleaned. Even so, if one remained stationary for too long one was liable to find oneself stuck to the floor!

We carefully made our way to the far end, noting the dismantled heating elements stacked all along the walls. Structurally, the 'valve' end of the tank was considerably more complicated than the 'access' end. Immediately apparent was a long sump, designed to accommodate the supply pipe when this was lowered to the horizontal position, presumably making it possible to drain the tank entirely. The pipe, with its swivelling joint and control cables lay, half submerged, in this pit.

The valve end of No.1 Tank with the sump in the foreground. Behind the towering wall is the external valve chamber and access shaft to the top of the tank

The swivelling joint at the base of the supply pipe, which is resting in the sump

The roof at this end of the end of the tank was raised above the general roof level. An off-centre cut-out in this gave access to the chamber at the top of the shaft which we had seen rising from the valve chamber on the outside of the tank. An unguarded vertical steel ladder ascended the tank's end wall to reach this area, as did pipes connecting to the heating system.

Good reverberations

The tanks apparently hold an acoustic world record for the longest reverberation, recorded in 2014 at 112 seconds. Although we did not know it, this was to be demonstrated to us. Our guides doused the lights, allegedly for us to

experience total darkness and absolute silence. As we were enjoying this moment of peace (or panic, depending on one's temperament), David fired a starting pistol. The effect was electrifying, and the long drawn-out, slowly fading echo quite remarkable and beautiful.

Before leaving, we were to be subject to one further 'scientific' experiment. Clive Penfold wished to validate the University of Salford's 2003 dismissal of the myth that a duck's quack does not echo. He had brought a duck whistle and, having commanded silence, sounded it. A rather rude noise reverberated around the tank: *quod erat demonstrandum*.

The portal to the main access gallery which services the Southern end of the oil tanks. Photo Nick Catford

The Invergordon fuel tank farms

From the WWII Inchindown underground fuel tanks, we travelled back down into Invergordon to inspect the Seabank surface fuel tank farm. Now abandoned, forty oil tanks, a boiler house, pump houses and numerous pipe runs remain extant – but, to date, still without any statutory protection.

A row of oil storage tanks at the Seabank tank farm. In the foreground, supply pipes run down one of the containment ditches

The first ten tanks were built here in 1913, as part of the Admiralty's programme for developing the Cromarty Firth as a protected anchorage. A further 31 tanks were added during the course of WWI – at which time they were camouflaged with paint. In WWII, they were encased in brick, although subsequently this cladding was very largely removed.

Tanks 6 & 7 have preserved their WWII brick cladding. The building appears to have been a small pump and valve house

The roofs of the tanks are supported by a complex system of internal steel trusses. As with the Inchindown tanks, heating elements were fitted to enable the viscous oil to be pumped. However, we did not enter any of these surface tanks to examine their inner arrangements. A pipeline connected the tank farms to the Admiralty pier, from which the bunkering of warships could be effected, either directly or via lighters for ships at anchor in the Firth.

A building adjacent to the boiler house contained an impressive set of valves. Photo Clive Penfold

The only recorded wartime damage to the site occurred in February 1941 when a Ju 88 bomber destroyed No.13 Tank and damaged an adjacent one. The tanks did not catch fire but the resultant oil spill polluted the Firth, despite the site's protective ditches and bunds. The tank was not replaced and the void remains to this day.

More tanks were added in phases, the original Seabank tank farm being supplemented by the adjacent 13-tank Cromlet site. Together they had a capacity of 110,000 tons of fuel[1], although some tanks were designated for other purposes – latterly including water, sullage and AVCAT (aviation fuel for ship-borne turbine-engined aircraft). The Cromlet tank farm was removed in 1991.

The rectangular concrete boiler house still contains two boilers, the burners of which carry Associated British Combustion Ltd maker's nameplates

Acknowledgements and thanks

We are grateful to Ross Bannerman, owner of the Inchindown tanks, for his kind permission for our visit, and to our knowledgeable guides, David Cook and Preston White who willingly gave up their time to lead us through and explain this and the Seabank facilities. All photographs are by the author unless indicated otherwise.

Notes

1. Allan Kilpatrick, *There was oil in them there hills*, *Subterranea* 24, September 2010
2. The Canmore record of the Inchindown Oil Tanks is at http://canmore.org.uk/site/173294
3. Chris Rayner, Underground Fuel Tanks in Dover, *Subterranea* 37, December 2014
4. The Portsdown installation was more extensive than Inchindown and Lyness, comprising six large tanks and three smaller ones.

Be a part of history and see your name on a sleeper in the tunnels of The Postal Museum's Mail Rail

Julia Scodie, Development Manager, The Postal Museum

Mail Rail ran beneath the streets of London for over 75 years, carrying billions of letters and parcels, and playing a pivotal role in the development of our nation's communications. Now you can make your mark on **one of the UK's best subterranean experiences** whilst supporting The Postal Museum's Mail Rail for future generations to enjoy.

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To find out more and Support a Sleeper visit postalmuseum.org/sleeper

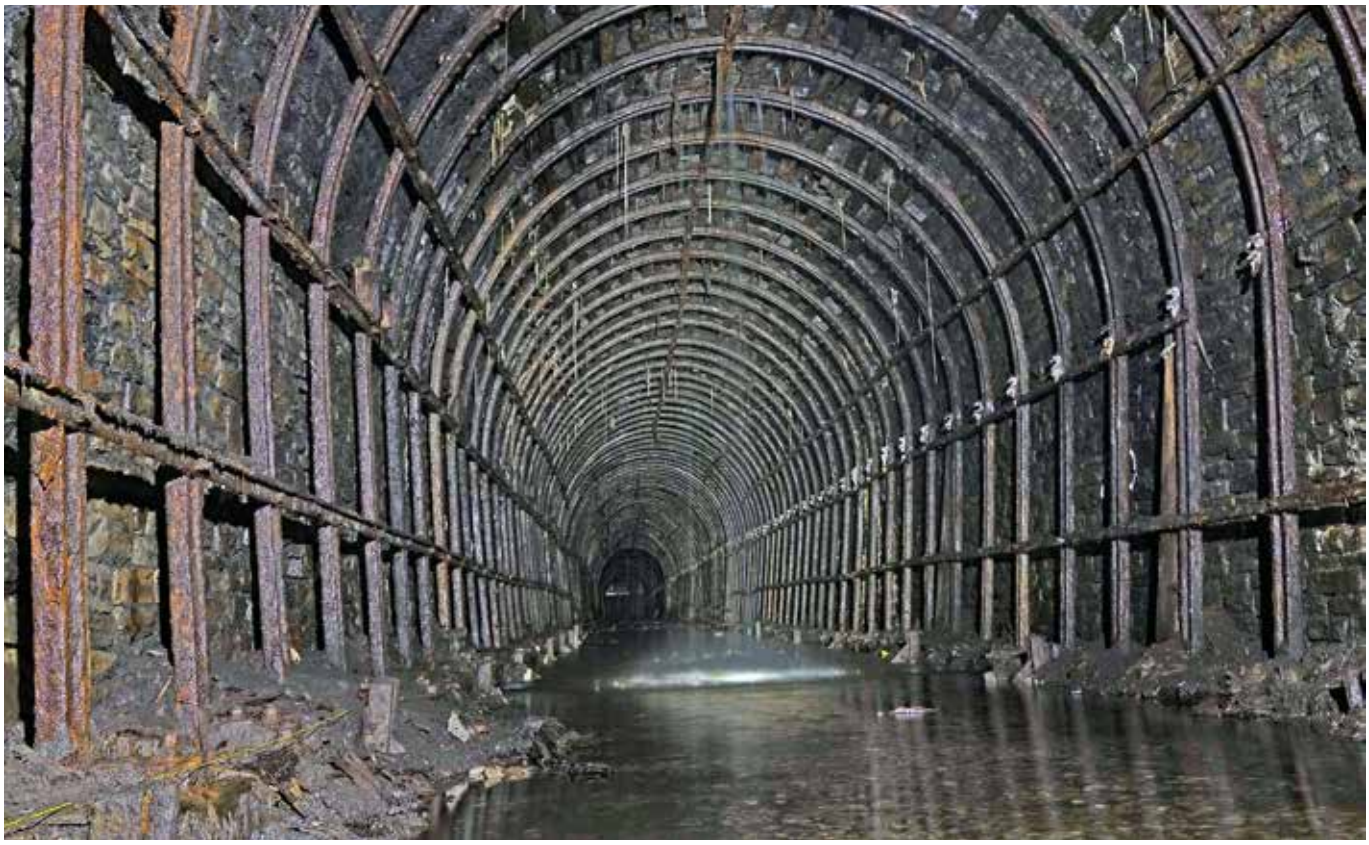
Support a sleeper plaque on Mail Rail. Photo copyright The Postal Museum

Group exploring the Mail Rail tunnels. Photo copyright The Postal Museum

The Rhondda Tunnel – Past, Present and Future

Tony Moon

Project Secretary and Trustee of the Rhondda Tunnel Society



Hooped rails near Blaencwm installed in 1930s & 1950s

Coal from the Valleys

The late nineteenth century saw a huge boom in the export of Welsh steam coal, with some of the richest seams located in the Rhondda Valley. Welsh steam coal was considered the best coal to power steam engines because of the intensity of its heat and lack of smoke.

This created a huge demand to fuel the massive growth of steam power for railways, shipping and industry worldwide. Most was exported by transporting it down the Rhondda and Taff valleys to the ports of Cardiff, Penarth, Newport and, somewhat later, to Barry.

Business interests in the Swansea area wanted a share of this trade through their ports further west – Neath, Port Talbot, Briton Ferry and Swansea itself. The Rhondda and Swansea Bay Railway was constructed to develop this market. It included the 3,443 yards long (3,148m) Rhondda Tunnel, which was opened in 1890.

Samuel Herbert Yockney and Son were appointed as engineers. Samuel H. Yockney had been chief engineer on Brunel's Box Tunnel; his son, Sydney William Yockney, was the chief engineer of the Rhondda Tunnel.

Construction of the tunnel

Construction started in 1885 with an initial estimate of three years to complete the job. Work started on the eastern (Rhondda) side six months later because of a land ownership dispute with the Earl of Bute's estate. His company had built Cardiff docks so he had no desire for

Location of the Rhondda Tunnel

a rival route to Swansea Bay ports. Progress was good initially but, by the end of 1888, construction was falling seriously behind and there were growing complaints.

Victorian tunnels were usually built by sinking a series of shafts along the line of the tunnel and lowering tunnellers down each of them to dig a series of short narrow headings towards each other, gradually linking together, thereby greatly speeding up construction.

However, the Rhondda Tunnel was too deep for this, so it was dug from both ends towards each other, putting considerable responsibility on the surveyors to get the alignment of the tunnel just right. On 23 March 1889, the two ends of the tunnel met in the middle with quite phenomenal accuracy – just half an inch out on the height.

A BR Derby Works 3-car suburban DMU (later to become Class 116) emerges from the Blaencwm portal of Rhondda Tunnel in the 1960s

Then, a month later, the contractor, William Jones of Neath, was sacked because of the slow progress and replaced by Lucas and Aird, a UK-wide railway contractor. They built more houses and gave the workers a pay rise to alleviate a labour shortage. It has to be remembered that the period was a boom time for the Welsh coal industry so skilled miners and tunnellers were much sought-after.

On 2 May 1889, Colonel Rich, the Board of Trade inspector, visited to approve the railway for opening. It failed because some 753 yards of tunnel had been left unlined. By this time, a number of tunnels had been constructed through the softer rocks of eastern England, and incidents of loose rock falling on passing trains were far from unknown. So the 753 yards had to be lined with masonry. This took just six weeks, and also saw one of the earliest uses of concrete in a railway tunnel. In July, Colonel Rich gave his approval.

The railway company was so keen to open the line that they started using it the next day, and the tunnel never had a formal opening ceremony: hence the blank space after "opened by" on the headstone (see illustration).

William Jones of Neath sued the railway company for £10,000 over its sacking in 1889; the matter was eventually settled in the High Court in London with their being awarded just £220.

Rail traffic and operational tribulations

The railway line was not a great success. Coal for export to the ports in the Cardiff area travelled downhill, so only the empty waggons had to be hauled back up. However, to get to the tunnel, coal had to be hauled up a 1 in 55 gradient to reach the tunnel entrance. This became known as the "Tortuous Climb".

Steve Mackey, Chair of the Rhondda Tunnel Society, who grew up in a house just below the climb, distinctly remembers some of the train crews' language when trains sometimes stalled on the climb and had to reverse a long way before getting up enough steam to try again.

Frequently, double-heading (two locomotives) was used. This meant that it was only economic for the pits near the top of the Rhondda to export via the tunnel to Swansea Bay. By 1905, the Great Western had taken over running the railway and, in the reorganisation of railways after WWI, took over the whole company.

The Rhondda end of the tunnel was always wet. Coal seams above and below the tunnel continued to be worked and by the 1930s, this was causing some of the masonry lining to work loose. Rows of bull-head railway rails were curved into hoops and installed in the tunnel to support wooden planks that would catch any loose stones. More were added in the 1950s, even though mining had long ceased in the immediate vicinity. However, as a result of mining subsidence, the Rhondda end of the tunnel is about 40cm lower than when it was built.

By the late 1950s, there were commuter trains running through the tunnel carrying steel workers down to the massive Port Talbot steel works, and many of the Rhondda Tunnel Society's older members remember happy summer days of childhood, going through the tunnel by train down to the seaside.

In 1968, distortion was found in the roof at a point where it passes through a geological fault. This led to an immediate temporary closure of the tunnel. To minimise the damage caused by a roof collapse, a 'cog' made of wooden railway sleepers was erected to support the roof in the event of further deterioration.

The cog erected in 1968 to prevent a collapse that has never happened. It is not in contact with the roof

That never did happen, and 54 years on, the cog is partly rotten and gradually collapsing under its own weight, without touching the roof. The Society wants to remove and re-erect a section of it on the surface as part of the story of the tunnel.

Closure and abandonment

By 1968, coal production in the upper Rhondda had largely ceased so there was little traffic through the tunnel. Indeed, the railway directly down the Afan Valley to Port Talbot had already gone. So instead of repairing the tunnel, it was decided to close the route altogether. Passenger train services were replaced with a bus taking the 12-mile route over the mountain, but this was withdrawn later due to lack of use.

We all know about the rapid demise of the coal industry at that time and there was then a widely felt attitude to 'move on' and forget much of the industrial past. The Valleys of South Wales saw massive changes, with the demolition of the pits, coal washeries, coking plants and all the associated industries, along with the redevelopment of the flat land, much of which had been needed for the huge railway infrastructure that had supported the coal industry.

Blaencwm portal being sealed (1980)

Government grants and low wages attracted much light industry to South Wales, so housing and industrial estates soon sprung up. Indeed, for a time, South Wales became a low-cost manufacturing region within the UK. Much of that industry has now moved on to lower-cost overseas locations.

By the early 1980s, both portals had been buried and the tunnel became largely forgotten. The headstone at Blaengwynfi was moved to a mining museum further down the Afan Valley whilst the one from the Blaencwm (Rhondda) portal went missing. That was actually most fortunate.

Many years later, the person who, as an 11-year-old, had written "Please Open Me", having since retired, was taking a long walk several miles down the valley. He noticed a large stone partly obscured by a bramble thicket and there it was – the missing headstone.

The headstone that went missing. "Please Open Me" was written by Steve Mackey, present chair of Rhondda Tunnel Society – then aged 11

He arranged for a Treorchy stonemason to make a replacement face as the original had been damaged and it was unveiled in its present location at Treherbert station. There followed a packed meeting in which the Rhondda Tunnel Society was born with the aim of reopening the whole tunnel as a cycling/walking route.

First steps

The tunnel had not been inspected since the 1980s; the expectation was that it would have collapsed in places, which would have been the end of this story. But this was far from the case: whilst repairs were needed, mainly at the wet Blaencwm end, there were no collapses, not even at the cog.

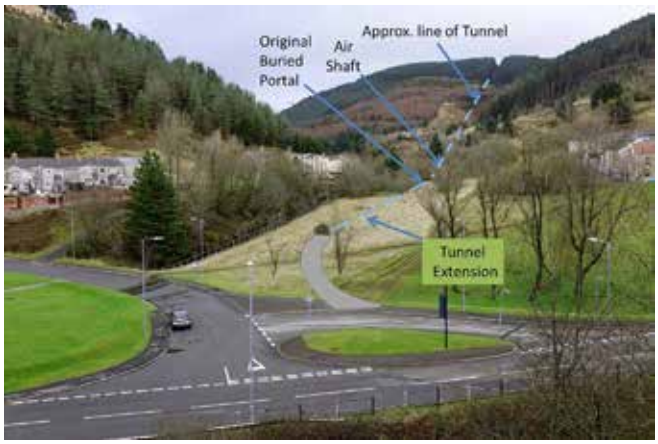
The Welsh Government paid for a bat survey and although the bat hunters were most thorough, the portals had been so well sealed that they could find no trace of the tiny mammals, which is actually a huge bonus as roosting bats can bedevil tunnel restorations. A detailed examination was carried out by Balfour Beatty Rail in 2018 which confirmed the overall excellent condition of most of the tunnel.

Whilst the Department for Transport (DfT) owns most of the tunnel, the last 100m at the Blaengwynfi end is owned by Neath Port Talbot Council. This was walled-off and, for 40 years, nobody knew what was behind that wall. Then in 2018 a hole was cut to expose a flooded tunnel with a big pile of rubble at the far end. Last year, the Society paid for another hole to be drilled to drain the 'lake'.

The way ahead . . .

The DfT is not allowed to reopen the tunnel but will transfer it to Wales, along with a sum of just £60,000 which is what it would save on any inspections. The Welsh Government wants much more and there has been a bit of a stalemate between the two over this – so the Rhondda Tunnel Society intends to get on with the job.

Our Technical sub-committee has drawn up plans to access the tunnel at Blaengwynfi for repair vehicles to enter either by excavating a trench down to the buried portal, protecting the sides with sheet piles, or by extending the tunnel with a steel tube using 'cut and cover'. It intends to apply for planning permission and raise funds privately to get access. The Railways Heritage Trust has already awarded it a grant of £100,000 toward this. Once vehicles can get into the tunnel, it can be repaired.



Possible tunnel extension at Blaengwynfi to access the buried portal

The Society has estimated the total cost to reopen the tunnel at £13.11 million (September 2021). This includes visitors' centres at both ends, tarred paths, lighting and security. Micro-hydro electricity from streams on both sides would power all the infrastructure, with a surplus to sell locally. The cost of reopening is likely to come from several pots; a bid for £5 million from the Heritage Lottery Fund is intended.

At just short of two miles long, the tunnel would be the longest cycling/walking tunnel anywhere in Europe – and when the Snoqualmie Tunnel (Washington state, USA) is shut in winter, the longest anywhere in the world. It takes

well over an hour to walk from end to end.

In order to fulfil its role as a 'must visit' attraction, such a long tunnel is going to need plenty of features to interest visitors. Bringing in big visitor numbers, and especially getting them to stay overnight by linking with other attractions, will be essential if the reopened tunnel is to provide the much-needed economic activity in an area that has suffered much deprivation since the demise of coal.

Creative thinking

The middle of the tunnel is dry and mild, and the walls contain a long series of alcoves, ideal for housing a range of features that will interest visitors. The National Library of Wales, based in Aberystwyth, has a massive digital archive that could be explored on a series of large-screen terminals housed in these alcoves.

Middle of tunnel with alcoves suitable for displays

Schools could be asked to decorate alcoves to show off their pupils' work. Other displays of art, local and industrial history could be included, as well as showing some of the interesting geology, such as coal seams, already visible in some alcoves.

The tunnel is wide enough to put a temporary divider down the middle to segregate cyclists from other users, with exhibits on the non-cycling side. In sections of the tunnel with bare walls, there could be music with appropriate light shows. Indeed, it has been suggested that a train passing through the tunnel could be simulated in light and sound, something described by people who have experienced the real thing as "dramatic".

The issues of safety and security are raised periodically, with some believing that such a tunnel would be a hot-spot for drug-dealing, mugging and related criminality. Evidence from long cycling/walking tunnels in Britain and the USA suggests that this is most unlikely. A lot of risks can be mitigated by ensuring that mobile phone communications are available within the tunnel, together with the provision of some CCTV.

Middle bare wall section – suitable for audio-visual effects. The scaffold tower was used for the 2018 examination

The tunnel can host large sports events: runs in tunnels are popular, especially because of the mild climate. Road cycling events can take advantage of well-developed mountain roads as part of the route. Indeed the spectacular views from the top will make one-way journeys through the tunnel with a bus-ride return a popular tourist circuit.

The forests over the top are covered in tracks that already attract many mountain bikers; for the less-fit visitors, electric buggies could be available. We envisage a ghost train at Halloween, and other seasonal events. Indeed, the Society is very much open to ideas on how to make the tunnel a major attraction.

As purely an active travel route linking two valleys, the cost-benefit case for reopening the tunnel is somewhat weak, especially with the fairly small population of the upper Afan Valley, but as an attraction bringing visitors from all over southern Britain and beyond, linked with other activities and places to visit in the area, the case for reopening is overwhelming.

If the Rhondda Tunnel is to be more than a travel route, it will need to be run by a management company with flexibility and incentives, but the question of how to pay its running costs does still need to be worked out.

Further information

The Rhondda Tunnel Society website:
www.rhonddatunnelsociety.co.uk

Graham Bickerdike, *Healing Wounds*, Rail Engineer, February 2016.

The National Archives at Kew has copies of the monthly reports from the tunnel engineers to the Board of the Rhondda & Swansea Bay Railway.

The National Library of Wales has copies of the Welsh newspapers detailing progress with the tunnel.

The Glamorgan Archive in Cardiff has copies of the maps proposing the route of the Rhondda & Swansea Bay Railway.

Committee Notice Board

By Linda Dixon, Secretary

There is a new section on the Members' Forum called 'Committee Noticeboard'. All members will have access to this. It will be used by the Committee to publish Notes of Committee Meetings, the AGM Minutes, copies of the Trustees report etc. If you wish to have a look at what we discuss in Committee Meetings, then please look there in future – they will no longer be published in *Subterranea*.

Cold War communications bunker, Přáslavice, Czechia

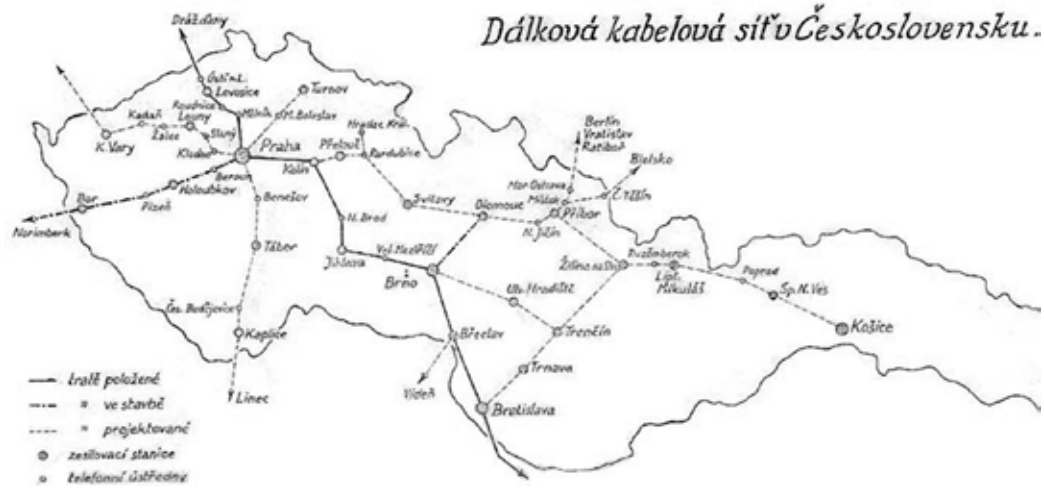
Kateřina Pašková

During a recent trip to the former Czech Republic a group of friends were lucky enough to go on a tour organised by Richard Hill of a recently-opened former military bunker at Přáslavice, 220kms east of Prague. The facility is now owned by Flenexa, a company working in production, energy and waste, who were kind enough to provide *Subterranea* with this history of the site.

Completed in 1976, the Přáslavice bunker was once shrouded in secrecy, and was an important part of a telecommunications route between Berlin and Moscow that provided a link between the East and the West during the Cold War.

But the genesis of the bunker stretches back well before the 1970s, when Czechoslovakia's Ministry of Posts and Telegraphs first began planning an inter-city phone network in 1923. By the end of World War II the majority of large towns were connected and it was understood that in a military conflict the network would play an important part, serving not just the military, but also the security and rescue services.

Aerial view of the bunker in 1971



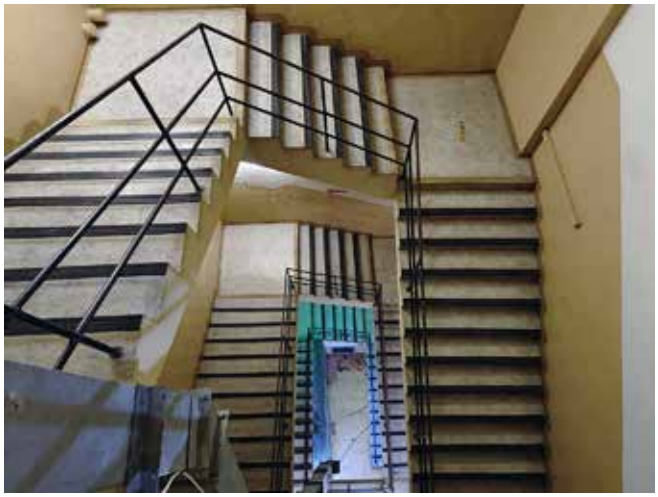
Map of cable network in 1928 in Czechoslovakia

outside large towns. Seven were built in Czechoslovakia, and the compound in Přáslavice is one of them. The eighth bunker, close to Tabor, south of Prague, was never finished, due to the collapse of the Communist regime. There were also bunkers in Slovakia and Moravia.

Cable intake room

Points of vulnerability

There was a problem though: the lines went through the centres of towns and were vulnerable to damage. If a town was attacked then communications right across the nation might be disrupted. As a result, work began on a top secret communications network running from Russia across Poland and (what was then) Czechoslovakia to Germany.



Four floors underground in the bunker. The total floor area is 10,000 sq metres

This was called the National Cable Highway, and demanded the construction of massive bunkers

Telecomms equipment. Photo Dave Maguire

A Warsaw Pact-wide plan

The idea of building these bunkers in the countries of the Warsaw Pact was first raised in the 1960s. After the tensions of the Cuban Missile Crisis had eased, there was a slight thaw between the East and the West.

A delegation of Soviet generals visiting the USA learnt that America had built bunkers and, on their return, this information fed into a plan to build a secret communications network throughout all the countries of the Soviet Bloc. This ambitious plan was never fully implemented and the only country where the network was actually completed was Czechoslovakia.

The highly-secret National Cable Highway was started in the 1960s at a time when Soviet bunkers were built underground. This was very expensive and, as a result, in the 1970s new and cheaper ways of construction were explored.

Telecommunication panels

Close-up view of telecomms equipment in detail

Convenient above-ground locations were sought. These had to fulfil several criteria, such as being seismically stable, properly oriented, and not needing huge concrete walls that could lead to overheating. In line with these requirements a former stone pit in Přáslavice, near the city of Olomouc (which is located in the east of the country), was chosen. At the time it was used by local people as a swimming pool.

Blast doors to the quarry at ground floor level

View of the rear of the bunker taken from within the quarry. Photo Dave Maguire

Four levels underground

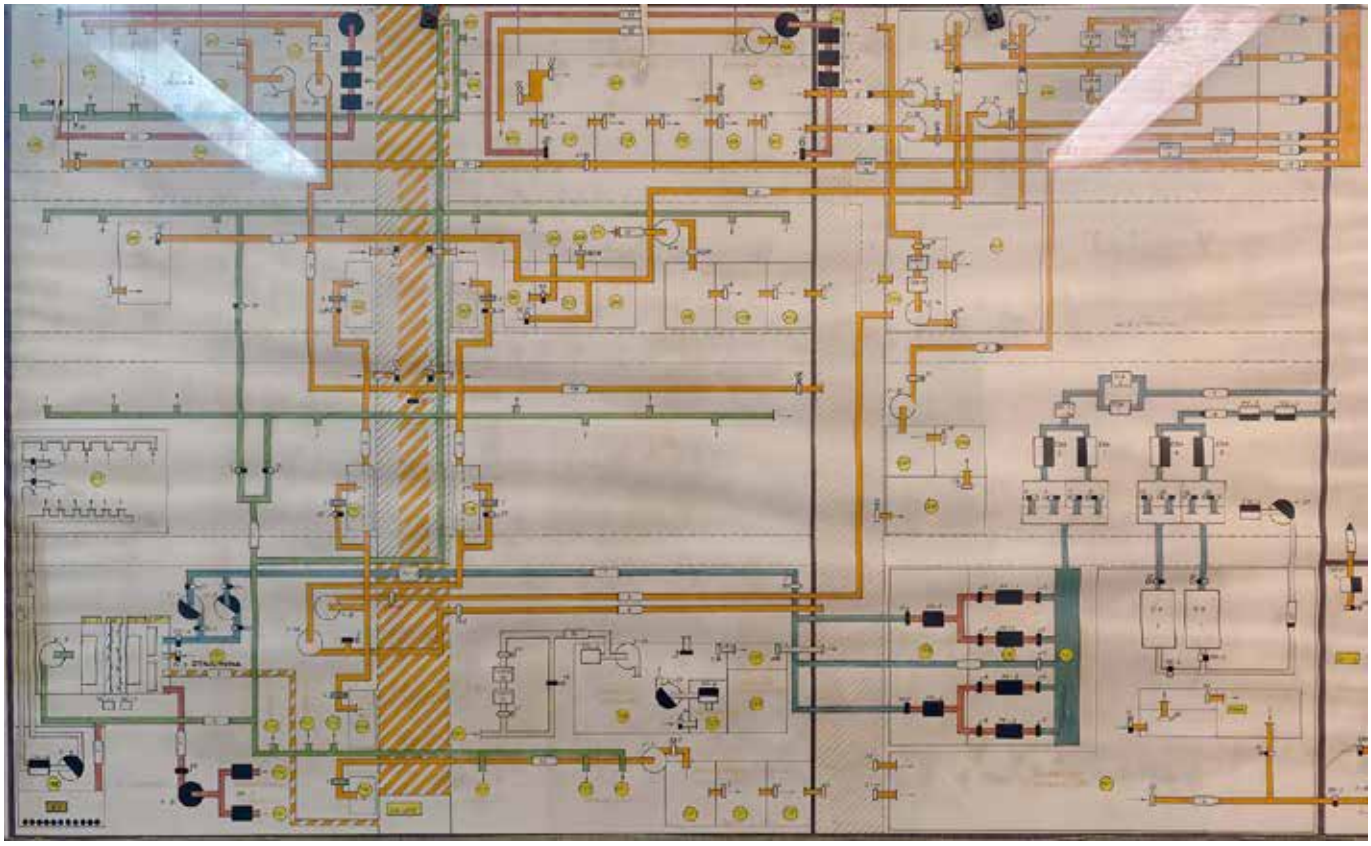
In 1970, work began on the bunker, which was informally known as Action 25. It was estimated that it would cost 110 million Czech Crowns. By 1976, the massive bunker was complete, boasting two above-ground and four underground storeys, offering a total space of 10,000 sq metres. The outside walls, of 1.5 m thick concrete, were rated as being proof against a 50-kiloton direct hit.

Construction was carried out in secret. The Czech Army, which was responsible for the whole process, brought in soldiers from distant parts of the country, and none of them (or their families) were allowed to know the purpose of the work.

The soldiers stayed in Přáslavice for weeks or months only and then were quietly returned to their home areas. State security oversaw the process and no one without security screening was allowed to enter finished parts of the bunker.

To prevent direct tapping of the lines, a fairly simple but clever system was invented. Each cable had four pressurised channels, each containing the copper wire that carried the communications. If anybody drilled a hole into the cable, the change in air pressure would be detected.

Coaxial cable, the most important element of the bunker



Ventilation plan

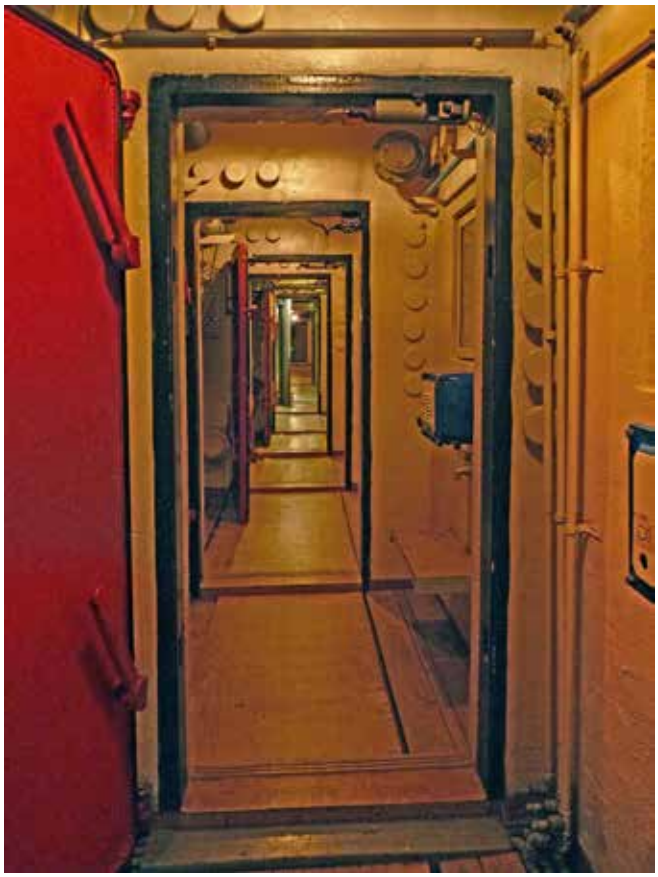
Decontamination suite

The whole bunker was kept pressurised to prevent the ingress of contaminated air in the event of a nuclear attack. There were also showers, and those entering the bunker would have had to leave their clothes behind and be issued with new ones after decontamination.

Equipment-loading corridor with airlock doors

The bunker utilised high-tech equipment: a filter system, air conditioners and 600 kW diesel generators. The lowest level held a sophisticated water treatment plant with three tanks, each with a capacity of 20,000 litres. There were two wells, one for drinking water and one for non-potable water.

A large area was filled with batteries, each of which could sustain operations for 45 minutes when fully charged.



Entrance to decontamination suite. Photo Dave Maguire

An escape tunnel to the nearby village of Mrsklesy was built under the guise of a well. Heat pumps provided heating and cooling. The original cooling system was replaced in 1999.

Diesel generators

Changing room, leading to battery room

Flow rate meter in the oxygen bottle store

Nuclear operations were expected to last a maximum of ten days: up to 60 people inside the bunker could survive this time without the need for outside supplies or assistance. The building was equipped with dormitories, kitchen and dining room, toilets, a first-aid station and mortuary. The occupants would be civilians, soldiers and secret police. The army unit numbered forty people, the police unit ten people, while there were around forty civilian workers, who worked in shifts of 10 to 15.

When empty the bunker utilised pressurised air, but when people were present this was topped up with oxygen. CO_2 levels were constantly monitored with special equipment, and this can be seen in the main control room.

Control room

Key cupboard. Some of the seal holders look suspiciously like beer bottle caps!

An air of normality

To ensure an air of normality in wartime there were posters, photos and fake curtains on the walls. Everything had to suggest that nothing out of the ordinary had happened outside.

Posters and fake windows

The Přáslavice bunker has been owned by a private company, Flenexa, since 2010, but as late as 2016 some of the parts were still secret and under restrictions. The owners were not allowed to enter these areas.

Five years ago the company began hydroponic vertical farming at the bunker, and visitors can now experience the site's unique combination of war history and sustainable agriculture. Tours are run every weekend, take approximately 60 minutes and are available in English if required. Individual tours can also be arranged via email info@bunkrPřáslavice.cz

For fans of war history, communications technologies and of unusual experiences, special functions are also planned. These include weddings, overnight stays and educational events. For map and more information see www.bunkrPřáslavice.cz

Hydroponic salad

Meet the Committee – Linda Dixon

Although the longest-serving member of the Committee I have avoided being featured within *Subterranea* until now so here goes!

I joined the Committee in the mid-1990s after making some proactive suggestions at an AGM. Somewhat bizarrely, I wasn't even a Sub Brit member at the time but had gone along with my (now) husband Martin Dixon who had been a member since the 1980s. In those days I was Linda Bartlett and after many years as an ordinary member I became Vice-Chair in 2010. In 2015 after our long-serving secretary Roger Starling retired, I took up my current role as Secretary.

Like many Committee members, I do a lot of work behind the scenes, in particular ensuring that our AGMs and Committee meetings are planned and recorded and managing our status as both a Registered Charity and not-for-profit Company. My background as a Programme Manager at British Airways means I have always been strong on process and project management. For many years Martin and I arranged Sub Brit study weekends, recently with Tony Radstone and very often with great help from local Sub Brit members.

In over thirty years' exploration I've seen some amazing sites, from the depths of the UK's deepest mine (Boulby, with a shaft 1,100 metres deep) through the extraordinary underground cities in Cappadocia to the standby Government Headquarters BURLINGTON beneath Corsham.

I reckon to have crossed at least four international borders beneath the surface, making many good friends along the way:

* England and France via the Channel Tunnel
* Denmark and Sweden through the Øresund crossing
* West Berlin and (former) East Berlin on the U-Bahn
* Belgium and the Netherlands in the Maastricht limestone quarries

Linda and Martin enjoying the view over the Cuillin Hills on Skye in June 2022

My other interests include gardening, archaeology, geology, and cooking. Through working at British Airways I've been lucky to have travelled extensively, from a DC3 flight over Angel Falls in Venezuela to Concorde across the Atlantic.

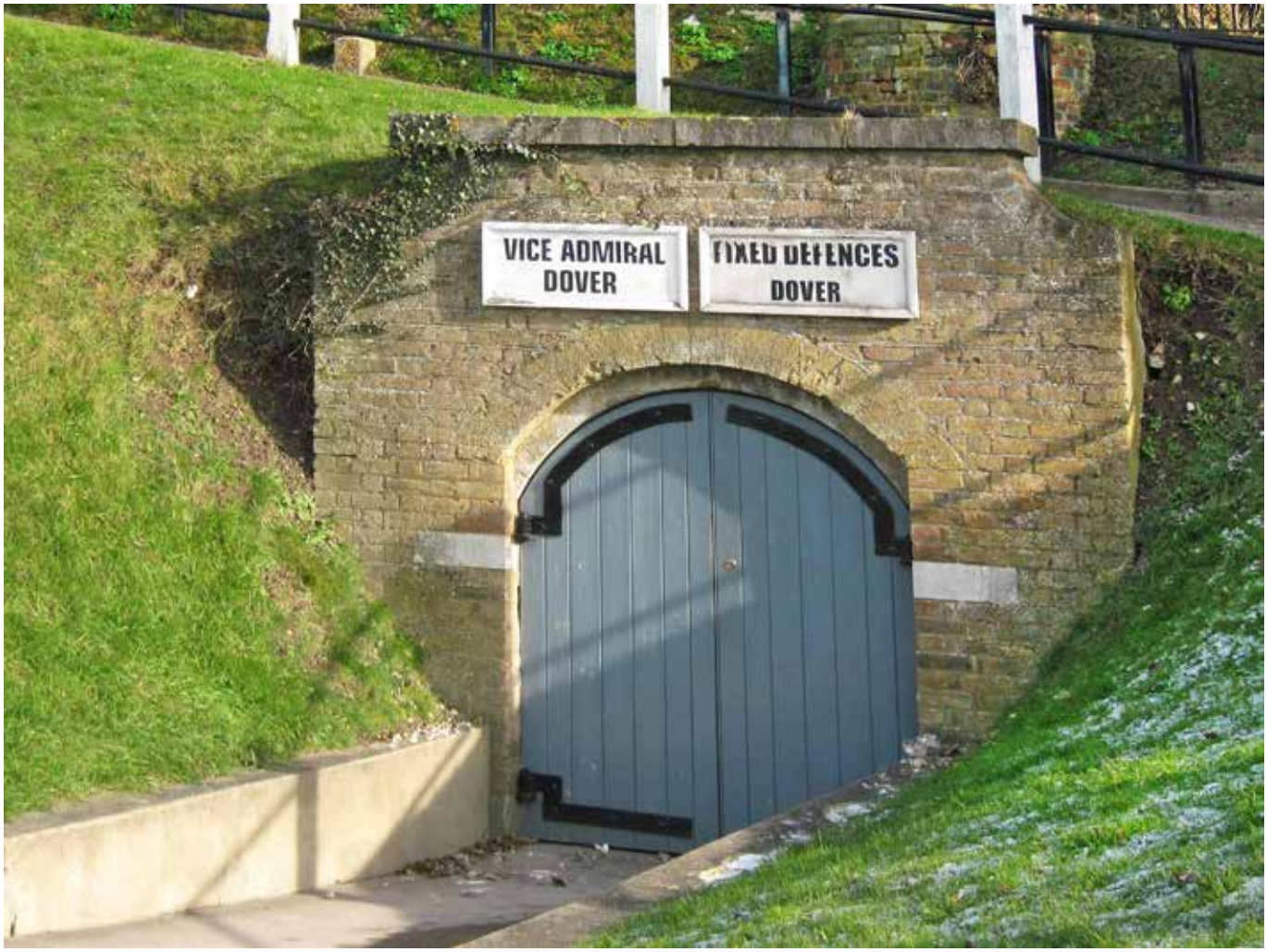
I also love rail travel and we recently spent three weeks on the Indian Hill Railways and have crossed Australia by rail both from north to south and from east to west. For 16 years we owned a narrowboat – *Dragonfly* – and have toured most of England's connected inland waterways, including countless tunnels of course!

The last couple of years have brought mixed fortunes. We've lost three great stalwarts of Sub Brit's early years – Paul Sowan, Sylvia Beamon and Malcolm Tadd. Plus Martin's illness means I've had to take more of a back seat within Sub Brit as he has needed my support both at home and for hospital visits.

To balance this, our many Sub Brit friends have provided much friendship and company throughout. It's also great to have had a bumper year of Sub Brit visits to once more explore the fascinating spaces that lie beneath our feet.

Dumpy: Dover Castle's Regional Seat of Government

Clive Holden



Entrance to Casemate Level tunnels

For nearly 900 years Dover Castle has helped guard England's South Coast, with its secret defences, far below the ramparts, playing an increasingly important role

During the Napoleonic wars (1797-1810), tunnels were excavated in the cliffs under Dover Castle to form a series of casemated (bombproof) barracks to house several hundred soldiers. They fell out of use over the next 100 years but were brought back into service during the First World War as offices and stores.

In the Second World War they were used by all three services but predominantly by the Royal Navy, when they became the HQ of the C-in-C Dover, Vice Admiral Sir Bertram Ramsay. It was from these tunnels that Ramsay conducted *Operation Dynamo*, the evacuation of the British Expeditionary Force from Dunkirk in June 1940.

During the Second World War, another two levels of tunnels were excavated under the castle to house a new underground hospital (later designated 'Annexe Level') and a forward Combined Headquarters (CHQ) for all three military services.

Entrance to Annexe Level tunnels

A change of plan

The tunnelling work for the CHQ was to be carried out by 172 Tunnelling Company and 693 Artisan Works Company of the Royal Engineers. The new CHQ was codenamed 'Bastion'. The excavations were planned to commence in January 1941 above and to the rear of the Royal Navy's facilities in the Casemate Level tunnels. However, the work had to be abandoned (if it ever actually commenced!) due to severe subsidence.

Photo of RE tunnellers displayed on the wall in Casemate Level

The work by 171 Tunnelling Company RE on Annexe Level was completed by January 1942 and it was activated as a Medical Dressing Station (MDS) soon after. In late 1942, the work on the CHQ by 172 Tunnelling Coy recommenced, but at a much lower level, excavating a new complex of tunnels and rooms. Spoil from the works was tipped out through a hole made in the cliff face. After the tunnellers had finished their work, they were followed by about 250 tradesmen of No 693 AW Company, Royal Engineers. They included masons, bricklayers, electricians and plumbers.

Job done

By early 1943 this work was completed, and the complex had been fitted out to form a complete joint headquarters, designated as 'CHQ Level'. It was fully equipped, with a back-up power generator and an air-conditioning system. Written communications within the complex were conducted using a Lamson vacuum tube system. The

WWII CHQ tunnel construction at DUMPY Level

new HQ was connected, by telephone, via an extensive network of cables, to the various coastal gun and anti-aircraft gun batteries, brigade HQs, airfields and naval establishments in the Dover area.

Part of the original WWII ventilation system

The security of the CHQ was always a major concern. Military police from all three services controlled the entrances to the underground tunnel complex, and armed soldiers continuously patrolled the perimeter of the castle. The security measures were tested in late 1943 when a small group of Royal Marines from Deal burst into one of the communications rooms, surprising the radio operators and forcing them to stand facing the wall while the Marines rampaged through the complex setting off thunderflashes. They had gained access to the tunnels by scaling the spoil heap which had been formed down the cliff face and entering through a ventilation shaft. This major failure in security was made good and no mention

of the embarrassing mock attack was ever made again for the rest of the war.

Postwar closure

After the war, the CHQ was closed, and the tunnels were cleared of most of the equipment and furniture. However, the increase in tensions with the Soviet Union following the Berlin Crisis of 1948 saw the reactivation and updating of some of the country's wartime radar stations, and an Anti-Aircraft Operations Room (AAOR) was opened in the tunnels under Dover Castle, utilising the former CHQ complex and the Admiralty's Casemate Level tunnels.

The role of the AAOR was to co-ordinate the area's anti-aircraft gun defences with the Ground Control Intercept (GCI) Radar Station at Sandwich and the RAF Sector Operations Centre (SOC) at Kelvedon Hatch in Essex. New blast-proof steel doors were installed at the entrances and exits, and steel plates fixed to the grilles of the ventilation shafts for added protection.

Inside, the operations room was overlooked by a balcony on three sides, fitted with curved Perspex glazing, giving a clear view of the plotting table below. Corridors around the outside of the room provided access to various offices and cubicles. The lower-level tunnels housed a generator, to provide emergency electrical power, and ventilation plant.

Postwar AAOR Operations Room at Casemate Level photographed c.1990 (Sub Brit Archive Collection)

The AAOR was staffed by army personnel tasked with filtering information from the SOC to the individual AA gun sites. The Dover AAOR continued in operation until the army's Anti-Aircraft Command was disbanded in 1955. The tunnels continued to be used by the Royal Navy until the Admiralty abandoned its headquarters here and, together with the remaining resident army garrison, vacated the castle in 1958.

The H-bomb threat

By the mid-1950s the entire system of UK wartime contingency planning had been completely revised. With the Soviet Union now in possession of the hydrogen bomb, it had the power to destroy whole cities, together with all surrounding transport and communications infrastructure. The devastating power of a thermonuclear strike limited the possibility of providing adequate shelter for the civilian population, so the requirement would be to deal with the prospect of millions of irradiated and displaced people, as well as similar numbers of dead and injured.

Even if a region was not physically affected by blast, radioactive fallout would affect people's ability to move about, refugees would be a problem, the national distribution system for food and other essentials would have broken down, there would be no imports of food, the national electricity grid would have been put out of action; there would be no effective national leadership, and underlying everything would be a sense of confusion, despair and fear for the future.

Regions would stand (or fall) alone

The expected resulting breakdown in communications between central government and the regions meant that each region would need to act as an autonomous authority until national government administration could be restored. The Regional Commissioner (usually a senior government minister), appointed by the government in the name of the Crown, would assume the mantle of central government authority within their region.

To fulfil this role, a large staff would be required, in effect a 'mini-Whitehall', to mirror most of the domestic departments of state. The Regional Commissioner would also have ultimate authority over their local military commanders and would be empowered to use their forces as they saw fit, either for defence against external enemies, to implement sanctions or to suppress internal dissent, as well as assisting with relief work.

The existing Regional War Rooms were deemed inadequate to meet the new requirements, so to support the Commissioners in their new extended roles, a new form of regional headquarters known as Regional Seats of Government (RSGs) was planned. However, cuts in the 1957 defence budget meant that any concept of new, purpose-built structures had to be abandoned. Instead, in 1958, it was proposed to adapt suitable existing buildings, where available, and repurpose them to serve as RSGs.

In the short term some existing war rooms were retained, including the No 12 (South Eastern) Region War Room at Tunbridge Wells, but between late 1958 and mid-1961 several suitable alternative sites were identified, including the wartime underground tunnel complex at Dover Castle.

RSG 12 is created

In 1958, the Dover Castle tunnels were handed over to the Home Office for adaptation into one of ten new proposed emergency Regional Seat of Government sites receiving the designation 'RSG 12'. Its purpose was to provide secure accommodation for the Regional Commissioner, together with their staff and military advisors, as well as a system of administration and supply during and following a nuclear attack.

The Dover RSG was designed to accommodate and sustain up to 450 essential personnel for several weeks.

The staff were split into five main functional groups: units from various ministries; public information services (including the BBC); the police and fire services; civil defence control and communications.

The Regional Commissioner, the Deputy Regional Commissioner and the Principal Officer, supported by a Secretariat, would form the nucleus of the RSG. A combined operations staff, scientific advisors and legal advisors would be on hand to provide additional support to the nucleus. Under them would come the representatives of the various departments involved in home defence: the uniformed services (military, fire, police and civil defence) together with a large supporting staff.

Camp Commandant

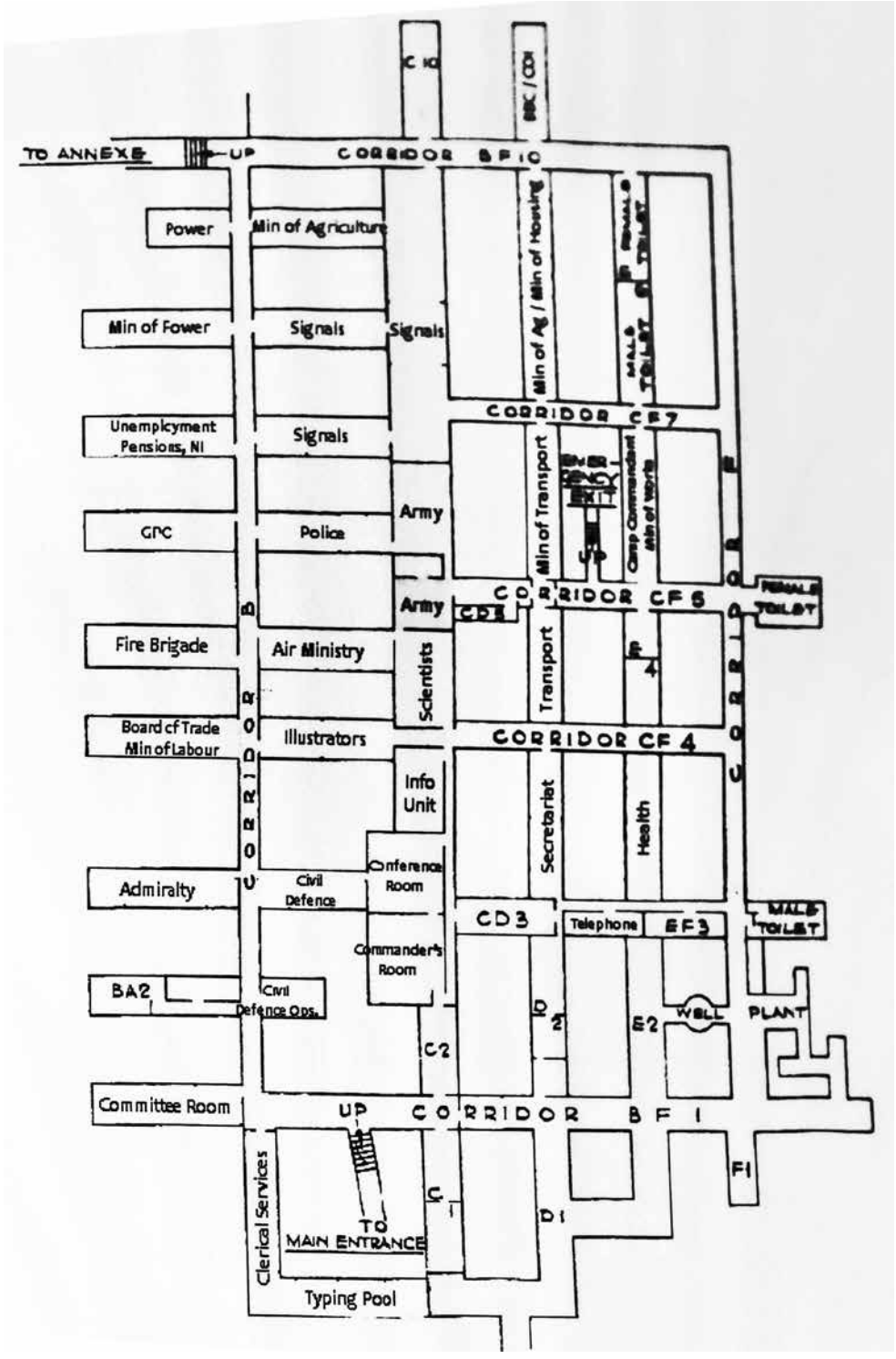
The RSG also had a Camp Commandant, who would be responsible for the building and its physical facilities. Their initial task was to prepare the site, allocate rooms to the various uses, and acquire furniture and rations where necessary. The Camp Commandant would also be responsible for security and reception of the staff. The majority of the RSG staff would have had no idea of their wartime role until they received a letter from their personnel department informing them of it.

A draft call-up letter in a Ministry of Health file informed the recipient that they had been "selected for duty at an important wartime HQ. So far as anyone can say at the moment you may be there for about a month."

The letter told the civil servant to go home immediately and pack their personal effects. They were warned that they would have to do their own washing but that "clothing may be informal" and, as entertainment would be limited, they should take some books.

They could draw up to £25 in advance of their salaries but should make arrangements for their salary to be paid to their spouse. Apart from this there was no mention of what their families should do. The staff would be instructed to arrive at the RSG independently or in small groups. Some would travel from London, while others would have come from the regional offices of their departments. Many of the junior staff would have come from local offices of central government departments.

Work on the RSG commenced in 1961 but was not completed until 1966. The lowest tier of tunnels at Dover, now designated 'DUMPY Level', became the communications and operations centre of the RSG and housed the various government departments. Dumpy was modernised and fitted out with new communications equipment, modern air-filtration plants and generators. A complete BBC studio was also installed, to



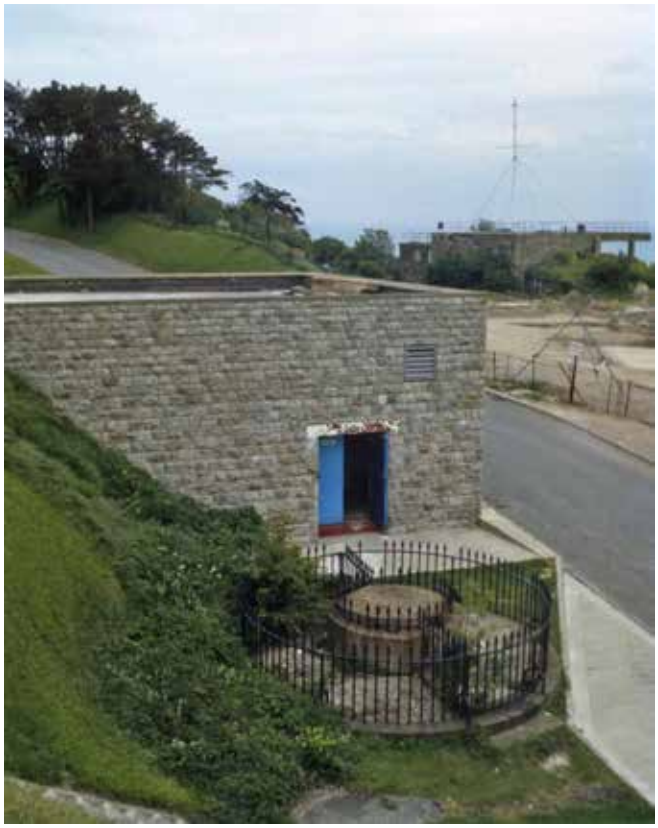
Plan of the RSG c.1966

enable radio broadcasts to be made to those who had survived the initial nuclear assault above ground.

BBC Studio c.1990 (Sub Brit Archive Collection)

Sealed off

The old spiral staircase entrance down to the tunnels was sealed at the top with a concrete cap, as a precaution against nuclear contamination. The main access was now via a lift from a new, purpose-built entrance block near the Officers' Mess, which was faced with stone to blend in with its far older surroundings



Entrance Block and the capped spiral stairway to Casemate Level c.1990 (Sub Brit Archive Collection)

Space was found for large reserves of food, fuel and water. Once the mains supply had been cut following a nuclear attack, water would be taken from a buried 24,000-gallon capacity storage tank, with pipework connected to the Casemate and Dumpy levels. There was also a buried 10,000-gallon capacity tank feeding a secondary distribution system via a 4,800-gallon tank at the top of the emergency staircase from the Annexe level.

Entrance lift motor c.1990 (Sub Brit Archive Collection)

The higher tunnel levels were used as stores and a canteen, and were also fitted out with new dormitories, rest rooms and a kitchen. Although the new RSG was meant to be top secret, its existence inevitably soon became known to many of the Dover residents and was often the subject of talk in the local pubs.

Casemate Level kitchen c.1990 (Sub Brit Archive Collection)

All change

Even before this refurbishment had been completed, the system for emergency government was changed again. In early 1962, the Home Office realised that reorientation of the RSG structure towards a more central government role had removed the link, previously maintained by the Regional War Rooms, between Whitehall and local authorities' Civil Defence Control Centres. To reinstate that connection, an intermediate level of control, the Sub-Regional Headquarters (SRHQ), was developed.

Each region was divided into two or three sub-regions, and 25 Sub-Regional Headquarters (SRHQs) created. The old Regional War Room at Tunbridge Wells was designated as one of the Southern Region SRHQs.

In 1965 the newly elected Labour government, now in the midst of an economic crisis, ordered a fundamental review of home defence. The review concluded that, because of the precarious economic situation, future civil defence preparations would have to be "restricted to measures which would be likely to make a really significant contribution to national survival."

As a result of the review, the idea of a permanent RSG that would be manned before an attack was abandoned in order

to give more flexibility to the control system. The plan now would be to focus on a network of permanent Sub-Regional Controls (SRCs) rather than a network of RSGs.

Many RSG sites were repurposed, with reduced staffs, into SRCs, including Dover Castle, which was designated SRC 5.1. The RSGs would still exist as an administrative control but would only be initiated within the SRC sites as and when central regionalised government control was required.

The SRCs would provide help and assistance to local authorities; provide a link to and assist utility organisations (electricity, gas, water, communications, transport etc) in the maintenance or resumption of power and water supplies, transport of food and other essential services; and assist in the overall command and control of the armed forces, police, fire and medical services.

A new reorganisation

The structure of emergency regionalised government was reorganised once again in 1973 with a reappraisal of the Home Defence Regions. New Defence Regions were established based on the old Sub-Regional structure, but with a reduction to seventeen SRHQs. Dover was designated as SRHQ 6.1., and remained in use until the late 1970s.

In 1981, just before yet more new work was due to start on the site that would have extended the service life of the Dover Crown Building (as the three tunnel levels and entrance block were now collectively referred to in official documents) beyond the late 1980s, the decision was taken to move operations to a new Regional Government Headquarters at Crowborough in East Sussex.

The Home Office finally abandoned the Dover tunnels in 1986, and handed them over to English Heritage. The upper levels (Annexe and Casemate) have been opened to the public for some years now, but Dumpy remains off limits, due to health and safety concerns, except for occasional, specially organised small group visits.

Sub Brit visit Saturday 1 October 2022

A bright early October morning found us at Kent's famous medieval fortress, which had been a guardian of England for almost 900 years. My earliest memories of Dover Castle are as a ten-year-old back in the 1960s visiting on a school trip from Essex. The excitement of exploring the medieval tunnels and the castle ramparts, with their cannon and anti-aircraft gun emplacements, left a lasting impression. However, it was another thirty years before I returned, with the castle now under the care of English Heritage and with more tunnels to explore, as Casemate Level had been opened to the public just a few years earlier.

I have been a regular visitor to the Castle now for the last twelve years and never tire of exploring its grounds, often discovering features that I had never noticed before. I'm also fortunate in being a member of English Heritage (EH) and the Friends of Dover Castle, both of which organise tours of many parts of the Castle not generally open to the public, including Dumpy.

Although the Subterranea Britannica tour would be my fourth experience of Dumpy, I was still excited about visiting this very special hidden part below the Castle.

As I was booked on the 12.30pm tour, I found myself with some time to spare so I had a wander around the Castle grounds before heading to Casemate Terrace, the balcony from where Churchill had stood gazing through his binoculars, scanning across the Channel during some of the darkest days of the Second World War. The terrace was also the meeting point for the day's Sub Brit tours of the Dumpy Level tunnels.

The second Sub Brit group waiting on Casemate Terrace for their tour

Down in the Dumpy

After ensuring we had all signed an indemnity form, Gavin, our EH guide for the tour, introduced himself and led us through the cliff-face shop into the Casemate Level tunnels, where we took the lift down to Dumpy. The original lift had been installed in the 1960s, utilising one of the Napoleonic-era Casemate tunnels' ventilation shafts, in order to provide a swifter access to the RSG. When EH took over the Castle they installed a new lift and extended the shaft to the cliff top.

Tour guide Gavin introducing Dumpy Level to our group

When we had all arrived at Dumpy level, Gavin delivered a summary of the different tunnel levels, including the debatable existence of 'Bastion' Level, Dumpy's aborted

planned precursor as a Second World War Combined Headquarters. Attempts to locate Bastion over the last thirty years have proved unsuccessful, raising doubts over its existence.

The subject of the more mythical 'Foundation' Level was touched upon but no evidence of this so-called 'last redoubt' has ever been found. Gavin went on to give us a brief history of the RSG network and explained how Dover RSG12 would operate within it before leading us off into its tunnel system.

Our first port-of-call was the plant room, with its huge fans and air filtration system, whose efficient operation would be essential for the survival of the hundreds of personnel that would have been encased in this underground labyrinth, possibly for weeks on end.

Plant Room ventilation system

Plant Room air filtration equipment

We went on to view the larger rooms that comprise the central spine of the tunnel network which formed most of the key areas in both the CHQ and the later Cold War complex. These included the Second World War Operations Rooms for the Army, Navy and RAF, as well as the main communications centre in each of the facilities from the wartime CHQ through to the closure of the SRHQ.

The first of these larger rooms we viewed was the Commander's Room where the man responsible for the running of the RSG operated from, and the Committee Room where the Regional Commissioner would meet with the heads of the other Government departments operating in the RSG.

The tour group in the RSG Commander's Room

From here we passed through the Information Unit into the Army Room and Signals Room, where armed guards would have controlled access into the most sensitive areas of the RSG.

RSG Information Unit room

RSG Signals Room

Abandoned relics

As we made our way through the tunnels, we saw various lots of abandoned kit, including lead batteries, fire extinguishers, telecommunications equipment, teleprinter machines, cooking pots, and lockers. Some of the items are now earmarked for transfer to other museums, while the rest will remain stored here until a decision is taken as to their fate.

We went on to view the BBC studio, a feature common to most RSGs, from where local personnel from the BBC's Wartime Broadcasting Service would operate in

Abandoned telecommunications equipment

the event of an imminent nuclear strike on the UK and the activation of the RSGs.

Initially operating as a national service, the WTBS would broadcast a post-attack statement every two hours for a 12-hour period confirming a nuclear strike on the UK, and warning of the danger of radioactive fallout. There would also be a regional service, tailored to local needs, broadcast from the RSG studios such as the one in Dumpy.

The BBC Studio

Gavin said that questions were often raised about the survivability of the RSG personnel in the event of a nuclear strike, given that Dumpy had been excavated out of chalk cliffs with the consequent risk of radiation permeating through the chalk. However, he explained, with Dumpy Level 140 ft underground, the risk was deemed minimal for the maximum of one month that the RSG was expected to be active.

The greater risk was with the higher levels: Casemate Level, which housed the kitchens and canteen, and Annexe Level, which was to provide the dormitory accommodation. An even greater radiation risk was with the 4,800-gallon water tank that provided the secondary water supply, and which resided close to the surface, near the top of the emergency exit staircase from Annexe Level.

Our final underground destination was to one of the washrooms. With hundreds of men and women working in the RSG, adequate sanitation facilities were an essential requirement. Dumpy was provided with male and female washrooms equipped to the most modern standards of the time.

The secondary water supply tank at the top of the emergency exit stairway from Annexe Level

Male toilets

Our tour now at an end, we were led through the tunnels to the lift, which took us back to the surface, emerging into the building which would have been the main access point for the RSG. When it was originally installed in the 1960s the lift did not reach the surface as it does now. Anyone wishing to access the RSG would enter this building and descend the flight of stairs to the left of the doorway down to the lower floor where they would present themselves at the security office to have their credentials checked. If authorised, would then enter the lift at that level.

The Entrance Block Security Office and lift entrance c1990 (Sub Brit Archive Collection)

Disguised entrance

The entrance block itself was made to appear as anonymous as possible, with its walls clad in similar stone to the Officers' Barracks that overlooked it, helping it blend in with the immediate surroundings, and with no signage to indicate its true purpose.

The RSG Entrance Block with the Officers' Barracks above and the now uncapped spiral stairway down to Casemate Level in the foreground

Today, a small sign to the right of the entrance displays the words *Lift to Regional Seat of Government*, but I suspect

Redundant fire extinguishers and lead batteries

that hundreds of people still walk past this bland-looking building most days without giving it a second glance, completely unaware that, had history taken a different and sinister turn during the Cold War years, in the tunnels beneath their feet hundreds of people would have been at work trying to bring back some order from the chaos that would have followed a nuclear attack on this country.

Our thanks to English Heritage and to Gavin for facilitating such an excellent visit.

All photos by the author unless otherwise stated.

Meet the Committee – Tony Radstone, Treasurer

I joined Subterranea Britannica twenty-five years back, lurking in the shadows until retirement and became Treasurer eleven years ago.

I previously ran my own travel company for 35 years. This gave me experience in using computing packages in managing finance and in organising international travel – a background which inevitably led to a Committee 'tap on the shoulder', with no explicit release date back into the community. However, I continue to secure my revenge by laundering our Gift Aid receipts into underground causes and by facilitating the dispatch of Sub Britters into numerous obscure, dark and dirty subterranean realms.

My interests in underground matters is wide-ranging, spanning industrial, transport and military spheres. However, my main subterranean interest is WWII and Cold War sites, which I try to combine with my love of travel in order to visit as many locations as possible, with a particular interest in Eastern Europe.

I devised and arranged the *In the Dark* online webinars during the Covid lockdown period, which I hope kept many Sub Brit members entertained, as well as engaging wider public interest in the underground world through YouTube.

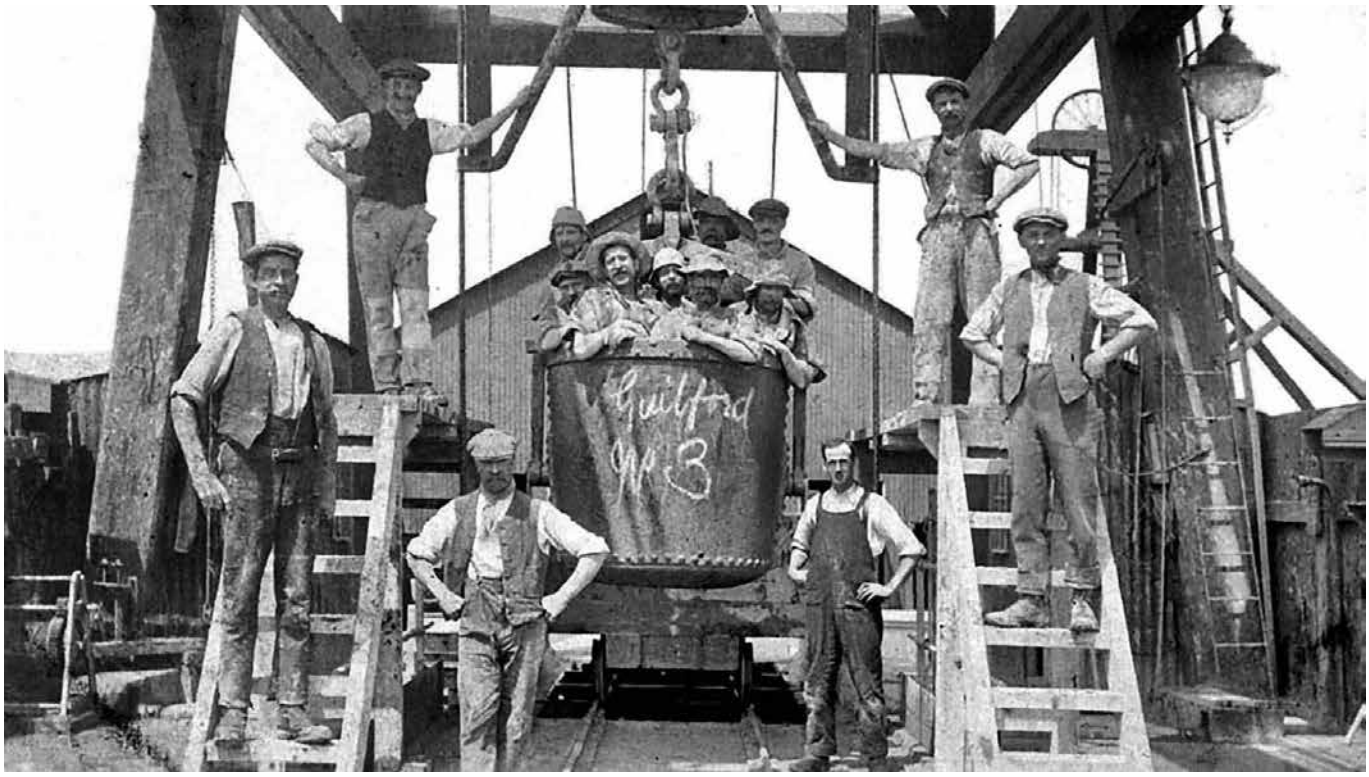
Outside of Sub Brit, my wife and I enjoy navigating the rivers and canals of Britain and continental Europe, usually in our road-transportable narrowboat. Ashore,

and nearer to home, I am a volunteer lock-keeper on the River Thames at Cookham Lock.

I'm also Membership Secretary, and arrange the outings for, my local U3A. In my spare time I'm a National Trust volunteer at the nearby Cliveden Estate where, in a team of two, I help recycle redundant items – anything from a salt cellar to a paving slab!

Mining the Garden of England

Colin Varrall



Veterans of a sometimes forgotten Kentish industry: workers at Guilford (Waldershare) Colliery pose for the camera

Ask most people where in Britain coal mining was once a major industry and one of the last places they are likely to mention is the county of Kent, often considered the Garden of England. Yet to ignore it is to overlook a colourful history

Across the Channel from Kent, explorations for coal began during the 1660s in the Nord Pas de Calais Mining Basin. A rich seam was discovered in the western part of the coalfield, which covers an area of 1,200 sq kms, spreading across the border into Belgium. By 1880, the output was almost eight million tonnes, accounting for a third of all French coal mined in the early 1900s. So it is no surprise that, from as early as the 1840s, British geologists began speculating that coal might also be found beneath Kent, especially after the discovery of deposits at Oignes, near the French city of Lens.

But there was another focus for mining in the county. In 1867, the consultant mining and railway engineer John Hawkshaw and his English Channel Tunnel Company presented a scheme to an Anglo-French commission proposing a rail link below the Channel, to be built with financial support from the London, Chatham & Dover Railway (LCDR).

However, the LCDR was unable to raise the necessary funds to begin the project, which was abandoned until 1875, when Edward Watkin, chairman of the Manchester, Sheffield and Lincolnshire Railway, and the Metropolitan Railway in London, persuaded the South Eastern Railway (SER) to provide financial assistance for a new attempt.

Working with the Nord Railway, the SER formed the Submarine Continental Railway Company, with the site for initial trial works being located below Shakespeare Cliff, on the water's edge between Dover and Folkestone.

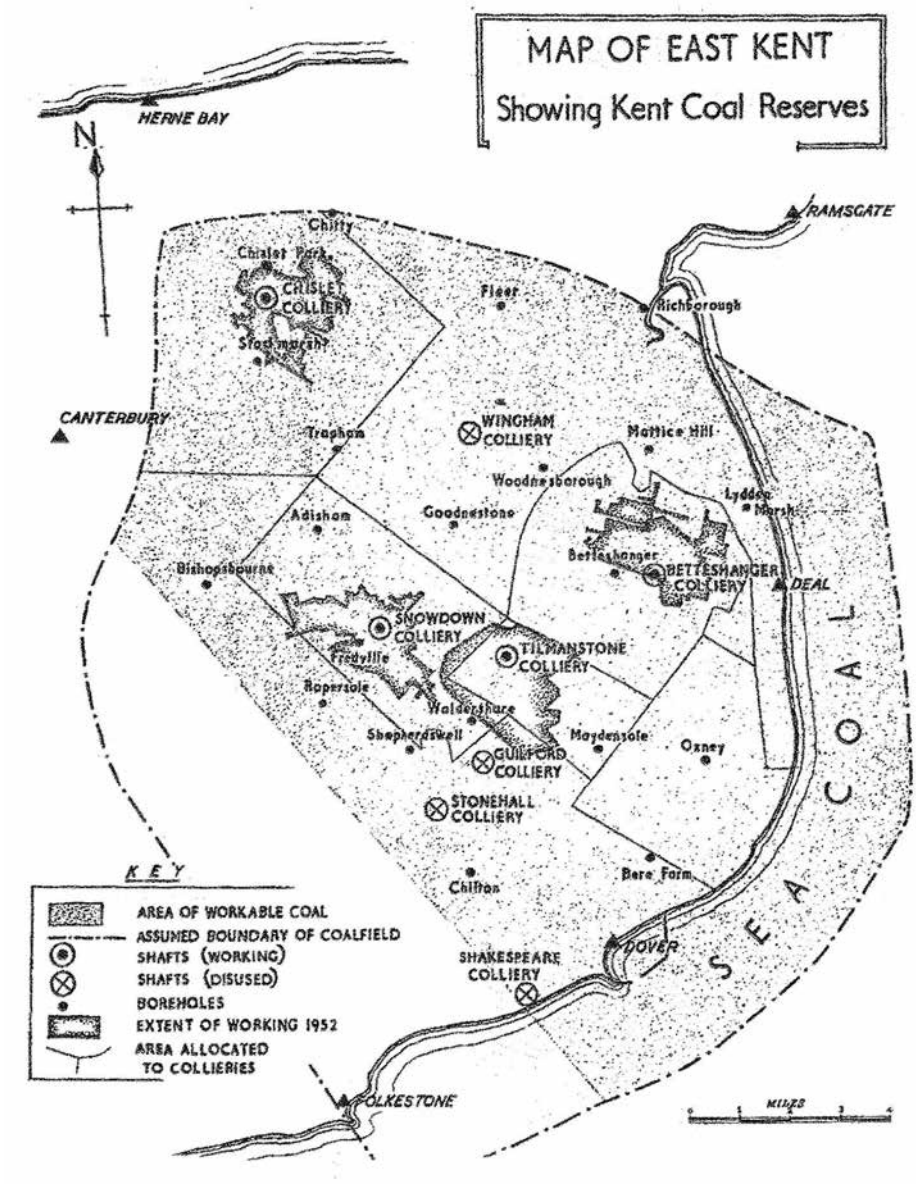
In 1882, the trial borings produced an access shaft 160 ft deep. Unfortunately, work was soon halted due to British government concerns about the possible risk of a military invasion by tunnel – but not before coal had been discovered during the digging (see *Subterranea* 36).

New focus, new opportunities

This is where a new figure stepped into the picture, which he would come to dominate in the coming years. Speculator Arthur Burr set up the Kent Coalfields Syndicate in 1896, after learning that both coal and iron ore reserves had been discovered below Shakespeare Cliff.

The company purchased the mineral rights and commenced trial borings for further coal deposits at what became known as the Shakespeare (Dover) Colliery. The first shaft (Brady Pit) was sunk in June. Two further ones followed, but they were prone to flooding, resulting in the deaths of several sinkers (miners responsible for digging and sinking a shaft).

Part of the problem was due to the coal seams being situated so deep underground in such thick undulating



Plan of the Kent Coalfield

seams. Pumps were often brought in to try and assist with the boring of shafts, but the miners would often be working knee-deep in water. There was a constant threat of flooding, and, on some occasions, sinkers died while working down shafts that were almost 1,000 ft deep, with flash floods bursting out and reaching the surface within just a few minutes.

Shakespeare (Dover) Colliery

Over the next twenty-five years, the Kent Coalfield came close to being completely abandoned on numerous occasions, mostly due to the constant problem of flooding in colliery shafts. Forty separate boring sites were scattered across the county, mostly in the southeastern region, to more accurately identify the scale of the Coalfield. Just prior to the First World War, eight different collieries were established, each consisting of trial shafts with associated surface buildings.

The Foncage Syndicate

Arthur Burr would eventually form and manage no fewer than 22 small companies involved with developing the collieries situated in the Kent Coalfield. In April 1906, he created the Foncage Syndicate, which would be responsible for sinking a shaft near Eythorne that became known as the East Kent Colliery, and later as Tilmanstone Colliery.

The first wages were paid to the workers there on 7 July 1906, and work began twelve days later. Just a couple of miles away, a viable coal seam was soon found at a trial boring close to the Waldershare Park estate, near the village of Coldred, on land owned by Lord North, who was also the Earl of Guilford.

Guilford Colliery, Dover

This soon led to the Guilford Colliery, or Waldershare Colliery, being established, also owned by the Foncage Syndicate. Work began to test the coal measures. By October 1906 the Syndicate had increased its capital for the provision of necessary equipment to £20,000. It was soon realised that this would not be enough.

Tilmanstone Colliery, Eythorne

The railway arrives

Further development of the colliery was halted through the winter, due to the limited access to the site via the local country roads. This led to the proposal of the East Kent (Light) Railway, to help transport construction materials to the colliery. The first application for its development was submitted in November 1909. This was for a lease of land at Coldred, and permission to lay railway track between the Guilford Colliery and the pre-existing South Eastern & Chatham Railway at Shepherdswell. The railway was heavily promoted by the Kent Coal Concessions Company.

That application was refused, but in May 1910 Kent Coal Concessions Limited applied for powers to build thirty-one and a quarter miles of track at an estimated cost of £173,500. Part of the original project was later withdrawn, but a Light Railway Order was eventually granted to cover a distance of nineteen and a quarter miles of rail.

Snowdown Colliery

These lines were intended to run from the main line at Shepherdswell to Sandwich, and to Richborough (near Sandwich) and Wingham, bisecting en route at Eastry. The line also passed Eythorne, bisected to link with the Guilford Colliery, and also passed close to the developing East Kent Colliery. By 1911, though, only Guilford and the East Kent collieries were showing any signs of striking the coal measures.

In December of that year, the first section of the railway was opened for freight traffic, with earthworks and a branch line to Guilford being completed by the following October. The East Kent Construction Company was contracted to build the railway, with the actual constructed work then being subcontracted. The Shepherdswell to Eastry section was laid by William Rigby, while the line from Eastry onwards was constructed by the engineer Holman Fred Stephens.

During November 1912, shareholders were given the opportunity to ride a passenger train that visited each of the collieries where their money was being spent. To avoid having to divert the line, a tunnel was built under Golgotha Hill, on the section between Shepherdswell and Eythorne. The tunnel was built to accommodate two sets of tracks, but only one was fully laid, and, as a result, only part of the chalk inside the tunnel was excavated.

By 1914, some of the collieries had been abandoned and when Britain entered the First World War, the railway company sought permission to open the line to passenger traffic. Special workmen's trains were also begun, with their own timetable.

Collapsing shaft

At the East Kent Colliery a second shaft was started on 19 November 1907. The first sod was turned by one of Arthur Burr's granddaughters, and the shaft named the 'Gabrielle Pit' in her honour. By May 1908, its shaft had reached a depth of 913 ft, 631 ft of which was brick-lined. The remainder was left unlined. Part of the shaft began to collapse, filling most of the lower section, and it had to be resent.

The sinking of a third shaft, the 'Rowena Pit', went ahead in August 1910, named after another of Arthur Burr's granddaughters. A viable coal seam was not reached until 12 March 1913, striking the Beresford Seam at a depth of 1,560 ft.

Just a few miles away, work began on Snowdown Colliery, near the village on Nonnington. The shaft was started on 28 February 1907, with the first sod being turned by Mrs Weston Plumptre, the wife of the landowner. The site had been chosen well, being situated adjacent to the main line of the South Eastern & Chatham Railway between Dover and Canterbury.

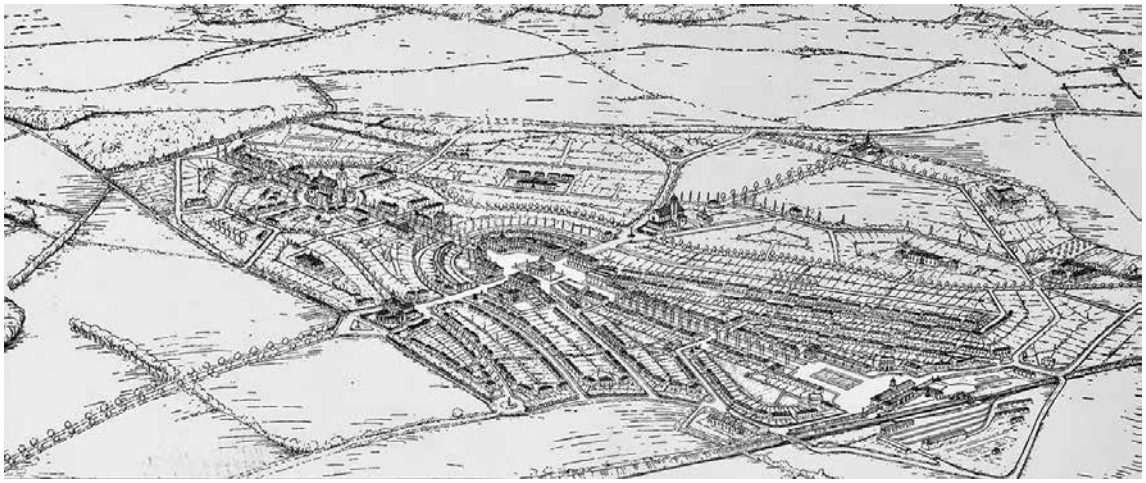
Snowdown Colliery also came under the management of the Foncage Syndicate. The colliery would eventually be the first to strike the Beresford coal seam at a depth of 1,370 ft in November 1912.

The most northerly colliery in Kent was situated just a few miles from Canterbury, and became Chislet Colliery.

Betteshanger Colliery

In 1911, the Anglo-Westphalian Coal Syndicate Limited leased land near the village of Chislet. A viable coal seam was eventually reached at a depth of 1,350 ft. The colliery was opened in 1914, adjacent to the Canterbury to Margate rail line. The first coal was not mined here until 1918, from two shafts sunk 1,470 ft and 1,457 ft deep.

The last colliery to be established in Kent was situated near the village of Finglesham and became Betteshanger Colliery, under the management of Pearson & Dorman Long. Work begun on sinking the first shaft in 1924, with one of the widest shafts in any of the Kent collieries, measuring 24 ft in diameter. Progress on the development of the colliery was rapid, with the shafts reaching viable coal seams by 1927.



Abercrombie's plan of Aylesham

Housing arrives late

It was not until the mid-1920s that permanent housing estates were planned to house miners and their families. Small estates were initially built close to each of the collieries as accommodation for safetymen and colliery officials. Houses were built at Woolage for Snowdown Colliery, and also at Lydden for the Stonehall Colliery.

By the late 1920s, much larger housing estates were being built, with several hundred houses constructed at Aylesham for Snowdown Colliery, Elvington for Tilmanstone Colliery, Hersden for Chislet Colliery, and the Mill Hill estate for Betteshanger Colliery.

Prior to these housing estates being built, the miners and their families had to find accommodation in local towns and villages. Many had experienced animosity when they first arrived, especially as they were often seen travelling to and from work in their 'pit black', since colliery bath houses containing showers and changing facilities were not built until the early 1930s. The hostility continued when it was noticed that many of the new mining community houses included purpose-built facilities and gardens.

Stonehall Colliery, which did not continue operations after WWI

A lost industry

In the 1960s there was talk of Kent collieries closing. The first to go was Chislet Colliery, in July 1969. After the 1984/85 miners' strike, further closures resulted in the loss of both Tilmanstone Colliery in October 1986 and Snowdown Colliery in 1987. Betteshanger Colliery remained until 1989, becoming the last colliery in Kent.

Nowadays, other than the Kent mining communities, very little remains. Of the collieries themselves, there are several large crumbling buildings left abandoned and derelict at the former Snowdown Colliery, while the other sites at Tilmanstone Colliery and Chislet Colliery in time became industrial estates.

One undoubted piece of good news is that the site of Betteshanger Colliery and its spoil heap have recently become part of Betteshanger Park, home of the Kent Mining Museum.

Further information

Kent Mining Museum, Betteshanger Park, CT14 0BF: www.kentminingmuseum.co.uk

Spelthorne Cold War Control Centre, Surrey

Keith Ward

Access to the emergency centre is through a blast door in the basement boiler room of the Borough Council office. Photo Clive Penfold

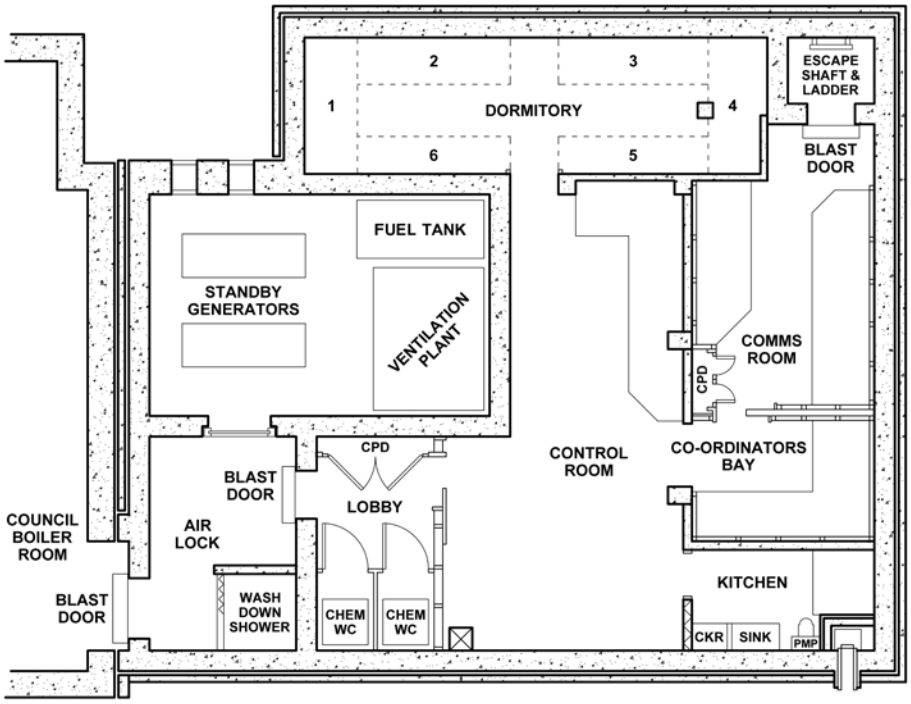
Spelthorne is the current council which has served the Staines area since 1974. A small group recently visited the former Cold War Control Centre that lies beneath the Borough Council Offices in Knowle Green.

Surrey Civil Defence

Staines was part of Middlesex until 1965 when the bulk of the county was incorporated into the new Greater London Council (GLC). However, the former Staines Urban District Council area was passed instead to Surrey. Staines Urban District Council (UDC) had used the basement of the council offices as their civil defence control, reporting to county control at County Hall Kingston, until the 1968 stand down of civil defence.

A large number of new civic centres had been planned in the late 1960s incorporating control centres in their basements but by the time they were built in the early 1970s no money was available for civil defence. Most of these civic centres were of brutalist concrete (like Harrow and Hounslow) and in the GLC area generally had just a small communications room in the basement.

Spelthorne Borough Council offices. Photo Clive Penfold



SPELTHORNE BOROUGH COUNCIL EMERGENCY CENTRE

DRAWN BY TIM ROBINSON

Editor's note: The emergency centre plan, which was supplied by Spelthorne Borough Council, shows a unit in the generator room which I have labelled 'Ventilation Plant'. There is no evidence of ventilation equipment and trunking for forced air ventilation ever being fitted as would usually happen in similar bunkers. It is likely that forced air ventilation was planned for the bunker but never fitted.

Surrey had a variety of bunkers in the 1980s of varying designs but all were rather small. Waverley Council for example used old cellars and Mole Valley had purpose-built space but accessed via an access door in the middle of an office. The least suitable provision was arguably Godalming which had a committee room above ground and a small comms room hidden behind curtains. The 1969 county control at Guildford technical college was just ground floor rooms. This eclectic mix was typical of most counties in the 1980s.

Creation of Spelthorne Council

Staines UDC new civic centre was constructed in 1972 and was a surprisingly pleasant brick-faced building with a clock tower. At that time however Surrey had no budget for civil defence. In the big council changes of 1974, Spelthorne council was formed from Staines UDC and parts of adjoining areas.

The 1974 changes made every borough and county appoint a wartime control site, a largely paper exercise as most locations were derelict or used as storage. In 1980 the civil defence control structure was revised and plans were made with the intention to build or convert premises at council offices. Spelthorne now reported to the new county control at Guildford technical college, opened in 1969 and immediately mothballed.

Finally in 1984 Surrey County Council received grants to improve civil defence facilities. At Spelthorne part of the utility basement was converted into a small control centre; however it wasn't until 1990 that the site was upgraded utilising a 75 percent Home Office grant. At long last, and just in time for the end of the Cold War, Spelthorne had a protected emergency control centre with blast doors, air filtration and emergency generator.

We gain access

Our visit was approved by the Council's Chief Executive and we were welcomed and well looked after by the Spelthorne Estates team. They had even made available an original plan that showed the final fit-out of the control centre, dated January 1990.

The air lock looking out of the bunker into the boiler room in the basement of the civic offices. Note the pressure relief valve in the wall to the right of the blast door.
Photo Tim Wellburn

We descended from ground floor offices into the boiler room; the compact control centre was reached from this. The entrance was through a substantial blast door and into an airlock. Off this airlock was the standby generator room – large enough for the offices above, not just the control centre. The airlock had pressure relief valves fitted to the external walls.

The two French Leroy Somer standby generators accessed from the airlock provide sufficient back-up power for the council offices as well as the bunker. Photo Clive Penfold

A fuel tank at the back of the generator room. The adjacent ventilation plant (shown on the plan) appears not to have been fitted. Photo Clive Penfold

Within the airlock we noticed an anomaly with the 1990 plan. The plan showed a wash-down (decontamination) shower but there was no trace of this either in terms of water supply or drainage. Entering the bunker proper through a second blast door, we passed into a small lobby area. This would have been used for storage as indeed it still is – the whole bunker is now being used as a storage area for the council. To the rear of this lobby was space for two chemical toilets.

Control, Coordination and Communications

The next room would have been the main Control Room which is at the heart of the complex. Beyond this was a small area designated *Coordinators Bay* on the plan (whether Coordinator's or Coordinators' isn't clear). This

One of the chemical toilets located in the lobby. Photo Clive Penfold

room linked through to the Communications Room, fitted with a long bench above which were various power and data outlets but no equipment remained. Some heavy-gauge aerial cabling still led up through the ceiling.

Control Room. Straight ahead is the dormitory with the coordinators bay to the right and out of view behind the photographer the kitchen. Photo Clive Penfold

At the rear of the Communications Room a small metal blast door gave access to the emergency exit which takes the form of a vertical ladder. Tucked off the Control Room is a small kitchen area with a single sink but no hot water. There seemed to be little room for more than a kettle and hardly any storage space for provisions.

An electric sump pump was backed up by a manual pump but this would only need to handle the sink as there were no plumbed-in toilets or decontamination shower. The kitchen area also housed a small ventilation pump, again backed up by a still working manual crank.

And so to bed

The final room was the dormitory which had six bunks against the walls taking up most of the space within. These were again being used as a storage area but somewhat

Communications room with a small blast door giving access to the emergency exit. Photo Clive Penfold

Emergency escape shaft. Photo Clive Penfold

The cramped kitchen includes a sink and a small ventilation pump. The only ventilation in the bunker. Photo Tim Wellburn

bizarrely the fitted bunks were of three different designs – one with a hard base and two different sprung designs.

The bunks in the dormitory now make convenient shelves. Photo Clive Penfold

After everyone had time for photographs we returned to ground level and walked around the car park. Here we were shown the stub ends of some radio cables, presumably en route to a former aerial. The emergency exit egress could be seen underneath a sealed manhole cover. Finally the exhausts from the standby generator set led up one of the exterior walls.

After the end of Cold War the centre remained in use for a while for civil emergencies but this function is now undertaken upstairs in regular offices. Overall the bunker is in first-class condition and shows how a typical late Cold War Council bunker was equipped.

Thanks are due to Martin Dixon for arranging the visit, to Spelthorne Council for making us welcome and in particular to John Hesbrook and Alan Fullarton for escorting us.

After the tour of the bunker members of Sub Brit examine the emergency escape hatch. Photo Clive Penfold

Harwich Fortifications: site visit 24 September 2022

Linda Dixon, Gerald Tompsett and Martin Dixon

Recent view of the Harwich Redoubt. Copyright John Fielding

We are indebted to Sub Brit member David Gordon, and to Andy Schooler of the Harwich Society, for organising a day of visits in Harwich, Essex – including the Radar Tower, the Redoubt Fort and Beacon Hill Fort.

A couple of dozen of us had booked to attend, but for various reasons, just twenty of us turned up on the day. There was a slight confusion about the meeting point as this had been changed quite late on, but we all made it. In future Sub Brit will try and use 'what3words' to pinpoint the meeting place. In this case 'drill.monument.towels' would have got you there!

Once convened, we split into two groups – half of us visited the Radar Tower first and half went to the Redoubt Fort. In the afternoon, we all visited Beacon Hill Fort, again in two groups.

Our group visited the Radar Tower first, and here we will hand over to Gerald Tompsett, one of the Sub Brit attendees on the day, who has put together a few words about this fascinating site.

Harwich Radar Tower

Peter Appleton from the Harwich Society was our guide and gave us a really interesting walk through (and ascent up) the Tower.

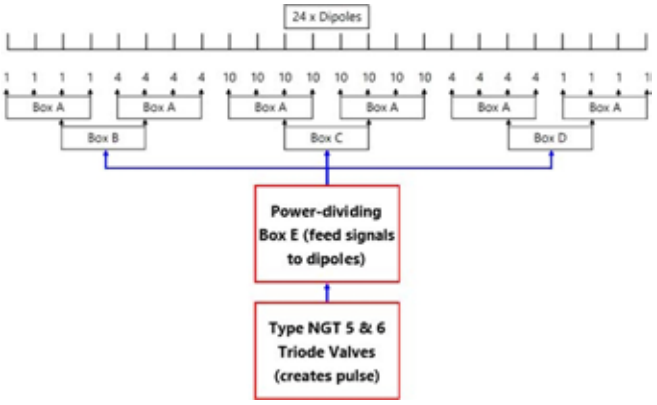
The Harwich Radio Direction Finding (RDF) Tower was built just before April 1941 and housed one of the earliest applications of RDF. Ten similar sites were built around the UK covering important rivers, docks and harbours. RDF became better known as RADAR around 1943, an American term short for RAdio Detecting And Ranging.

The tower was used to cover the naval minefield that had been laid across the Orwell estuary between Essex and Suffolk. The range and bearing would be transmitted to one of the Extended Defence Officers (EXDO) posts at Beacon Hill or Landguard Fort (on the northern entrance to Harwich Harbour), from which the appropriate mines were selected electrically and detonated.

The ground floor of the tower consists of five rooms: the generator room, crew accommodation, mess room, toilet and lobby (this includes a hatch to the middle and top floor, used to raise equipment). The middle floor has an extensive display of artefacts and displays that explain the Tower's operation.

The top floor houses an extremely rare survivor, a Type 287 RDF array. This is largely original and consists of two 'pig trough' reflectors with a range of two miles, enough to cover the offshore minefield. The Type 287 was a modification of the earlier Type 284 that had been used on battleships and was developed by J F Coales and R V Alred of the Royal Naval Signal School. We were impressed by the restoration and renovation that the volunteers had completed to make the array look as good as new.

The 50cm wavelength and five-degree signal width made the types 284 and 287 ideal for pinpointing vessels at sea level.


24 x Dipoles
1 1 1 1 4 4 4 4 10 10 10 10 10 10 10 10 4 4 4 4 1 1 1 1
Box A
Box A
Box A
Box A
Box A
Box A
Box B
Box C
Box D
Power-dividing Box E (feed signals to dipoles)
Type NGT 5 & 6 Triode Valves (creates pulse)

Type 287 RDF block diagram.
Copyright The Harwich Society

Operating details

A master Oscillator generates a 600 MHz carrier wave; this was amplified using a NT93 Triode valve and other valves fitted into a vibrating ring, although later on in the war this was replaced by the Magnetron. The operator display would have been a CRT (Cathode Ray Tube) as later used in televisions.

The information put into dial readouts would show the bearing and distance for target vessels for plotting and recording in the log. This would determine the group of mines to be detonated.

Dial read-outs. Photo John Bray

When the tower was discovered and opened in early 2000, subsidence was found; this was corrected in 2012. The building was full of rubbish and this was cleared out. Only the Antenna trough on the top floor remained.

The antenna on the top of the building consists of two parts – transmission and reception. It consists of 24 dipoles split into six sets of four. These were fed in a way that allowed a narrow beam to be produced that could be reflected by vessels at sea level.

Exterior view of the tower as it is today.
Photo copyright Maria Fowler

Reflector as it is today. Photo copyright Maria Fowler

Rear view of reflector. Photo copyright Maria Fowler

For further information, there is a good section on the Harwich Society. Some of the text here has been reproduced with their permission

Back to Linda, I thought this was an amazing construction, I'd never really seen anything like it. What a grand job the volunteers have done in restoring the whole tower, but particularly the top room with the array. I was also tickled by the two mannequins demonstrating how the

A representation of how it might have looked. Photo John Bray

array would be moved – it didn't turn 360°, but was rather pushed/pulled through maybe 120°.

Harwich Redoubt – History

So, on to our second visit of the morning. This was a ten minute stroll, through the leafy lanes of Harwich and into the Redoubt. This site is regularly open to the public, but we had our own tour with John Theobald, a superbly knowledgeable guide.

Harwich Redoubt, looking at the entrance. Photo Bob Clary

The Redoubt was built to defend Harwich against Napoleon, with whom Britain was waging war between 1803 and 1815. The foundations of the fort were laid in 1807 and in 1809 the eighteen casemates and ten gun embrasures (for 24-pounder cannons) were ready to be armed.

The garrison was designed for six officers and 250 men. The fortification is one of three redoubts (the other two are at Dymchurch in Kent and Eastbourne in Sussex) forming part of the Martello Tower chain of defences, extending from Aldeburgh to Seaford. It is a huge site – 200ft (60 metres) in diameter, with a central parade of 85 feet (26 m), containing a well for fresh drinking water, and with walls three feet thick.

Granite defences

As we'd entered the Redoubt on the upper level, that's where we started our tour. First we went back over the bridge entrance to look into the 'moat'. The Redoubt was actually built into the hill, so that the gun positions were on a level with the land. The fort is faced with huge granite blocks, easily still visible, although we were told that there is much debris in the moat, and it was originally much deeper.

Harwich Redoubt looking away from the entrance. Photo Bob Clary

Then, back into the fort where we started our exploration of the ten gun emplacements. Many of the positions have the gun rail still in place, and there are also examples of the guns in place.

John explained how the guns were charged and fired – the plan was for the gun crew to fire two rounds a minute. Water was brought up from the well in the courtyard by a system of pulleys, to cool the guns between each firing. Some of the brackets to hold the tools are still in place.

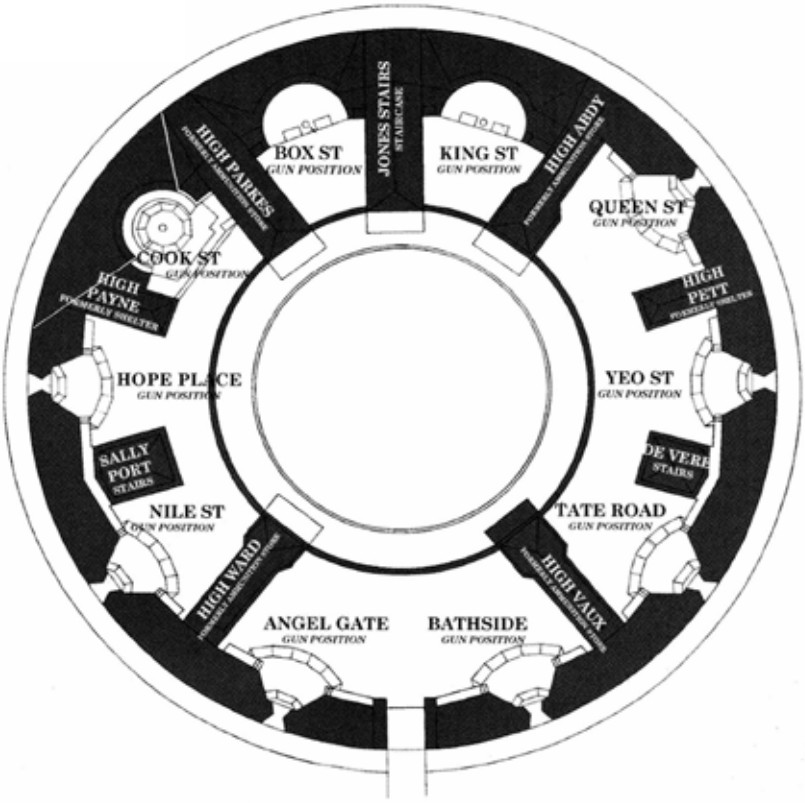
B&W aerial photo from the Harwich Society website. Copyright The Harwich Society

We climbed to the upper level to view the field of fire of the guns. It was a fantastic day and the visibility was huge, so we could see some of the big container ships waiting to come into the international port – also visible down to our left. It was easy to see why the Redoubt was built here, to give protection to the harbour and the port. We could even see in the distance the old Maunsell Forts, still standing some eight miles out to sea.

Back down and into the gun level, we also explored the forward ammunition stores – at least these felt a bit like being underground, due to the thickness of the walls and the darkness; a good chance to use our torches. Ammunition was brought up from the main stores below.

The large cannon in the bay named 'Cook Street' was the Gilbert Gun, once the latest in cannon developments.

Harwich Redoubt - plan of upper level (gun deck)



Upper-Level names

Angel gate - gun position. A gun battery of this name stood next to the present Navigation House at the time when the Redoubt was built.
Nile Street/Hope Place/Cook Street/Box Street/King Street/Queen Street/Yeo Street/Tate Road - gun positions. These are the original names identifying the gun positions. The most likely explanation is that the first gun crews allocated their own names, possibly taken from their home areas; they are not local names.
High Ward - formerly an ammunition store. Ward is a local name of a well-known family of solicitors, three generations of whom commanded the Harwich defences.
Sally Port (staircase) - a small exit door from the fort.
High Paine - formerly an ammunition store. Paine's tree, marked on old charts as a landmark for mariners, was removed to make way for the Redoubt in 1808.
High Parkes - formerly an ammunition store. Parkes was the founder of Parkeston – a village built to house railway workers. Parkeston Quay named after him in 1882.
Jones (staircase) - named after the captain of the Mayflower, who lived in King's Head Street, Harwich, in the 16th/17th century.
High Abdy - formerly an ammunition store. Abdy was the Lord of the Manor and High Steward of Harwich in the 1920s, who lived in Michaelstowe Hall which is 4 miles from the Redoubt.
High Pett - formerly an ammunition store. Petts were famous 16th/17th century family of Harwich shipwrights.
DeVere (staircase) - 1st Lord of the Manor, lived in Castle Hedingham, 11th century.
High Vaux - formerly an ammunition store. Vaux were shipbuilders and built many fine ships at Harwich Royal Naval yard during the 19th century.

This propelled a shell of 250 pounds; it replaced earlier guns of 68 pounds and 32 pounds, themselves replacing the original 24 pounder guns. This large cannon had a rifled barrel – we felt inside to prove this.

When this gun became obsolete in 1900 it was physically pushed over the embrasure and allowed to fall into the moat. It was rediscovered and rescued in 1970 as renovations started. John, our guide, believes that two more of these huge guns may still lie hidden in the moat.

Casemates

Now we descended to the lower level to have a look at the Casemates. These are all in a tremendous state of preservation; most had exhibits covering so many aspects of military life, warfare, life in the wars and so on – not enough time to study everything! John took us into the middle of the courtyard to study the well – it still has clean fresh water, a vital ingredient of life in the Redoubt.

We worked our way round all the casemate rooms, with John pointing out some of the features. We looked into the ammunition and gunpowder stores, noting the shifting lobby, where soldiers changed into special clothing without any metal, thus avoiding any sparks which could ignite ammunition or gunpowder. The lamp lighters' passages are also visible; where lamps would be lit from outside the ammo store, in special enclosures, to cast light through glass into the stores without risking a naked flame.

Other rooms housed the artillery store, the laboratory and the shell magazine and after John's tour we were able to look round at our leisure.

After a good exploration, as it was such a nice day, many of us chose to eat our packed lunches on the picnic tables scattered around the site – and thanks are due to the volunteers who put on the tea urn, making welcome cups of tea and coffee for us.

Internal view of the Redoubt.
Copyright photo Maria Fowler

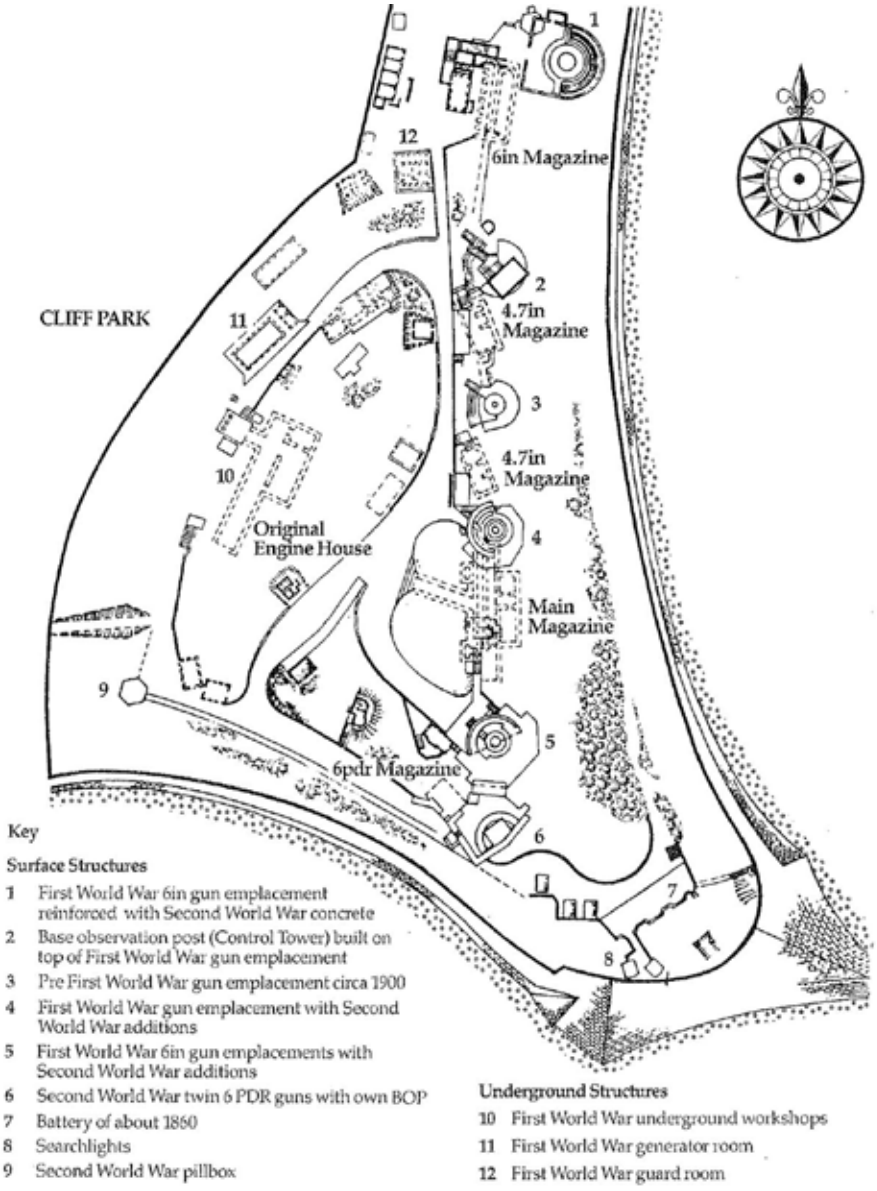
Historical overview of Beacon Hill Fort

Suitably refreshed, we set off for our third site of the day – Beacon Hill Fort. Martin takes up the narrative here.

Passing the Radar Tower visited earlier, we entered the secure compound which holds an immense richness of defensive artillery dating from the 19th and 20th centuries. The original Tudor blockhouse has been lost to the sea but the remaining periods remain and like the layers of an onion the more recent structures are built on and adapted from earlier stages.

The fort of 1889 was innovative, being built to be largely invisible from the sea and employing the protective 'Twydall Profile' on the landward side. From an underground perspective, the site has what is understood to be the earliest example of a bombproof shelter for personnel amongst other subterranean treasures. Above ground, the defences from this period included one 10-inch and one 6-inch gun, both mounted on disappearing carriages, supported by two 4.7-inch quick-firing guns, all breech-loaded.

1890 10-inch gun emplacement adapted in 1904 for a 6-inch quick firing gun. Photo Bob Clary



By World War I, the weapons all became 6-inch calibre and the magazines and shell hoists were modified to suit. Searchlights were added, powered by the earlier coal-fired generators.

Position-finding cells were added to improve accuracy and a telephone system introduced to allow effective communication between those targeting and the guns themselves. Finally, two one-pounder guns were introduced as very early anti-aircraft guns.

In the lead up to and during World War II, improvements continued apace. A key improvement was the introduction of covered casemates and a four-storey Battery Observation Post. Updated 6-inch pieces were installed in earlier casemates, one with a Bofors anti-aircraft gun on the roof.

It was at this time that the Radar Tower visited earlier in the day was constructed. Most personnel lived onsite and some buildings were retained but put to new uses (for example the 1890 guardhouse was converted to a Master Gunner's

house in the 1930s and later served as the Officers' Mess). Lastly, perimeter defences including pillboxes were improved and constructed.

Above ground

The Sub Brit party split into two groups and visited the various locations in a different order, guided by volunteers Peter Appleton and Barry Sharp. I'll describe the above-ground features first, followed by underground structures and finally some of the perimeter features. A small part of the site lies outside the current owners' property and was off-limits.

The World War II gun positions are all extant and better preserved than most in the UK. In most cases the foundations of the earlier structures can be distinguished. One of the 6-inch positions had a remarkable acoustic quality – standing in the centre and whispering generated an intense reflected sound that was quite striking. Some of the improvements were apparently made at speed as for example, the cast concrete covering of the casemates incorporates earlier stairways and even guard rails within its structure.

Battery Observation Post. Photo Bob Clary

The initial and final purpose of other structures was not always clear but amongst those viewed were officer accommodation, guard hut, stores and workshops, fire engine shed, electricians store/shop and latrines.

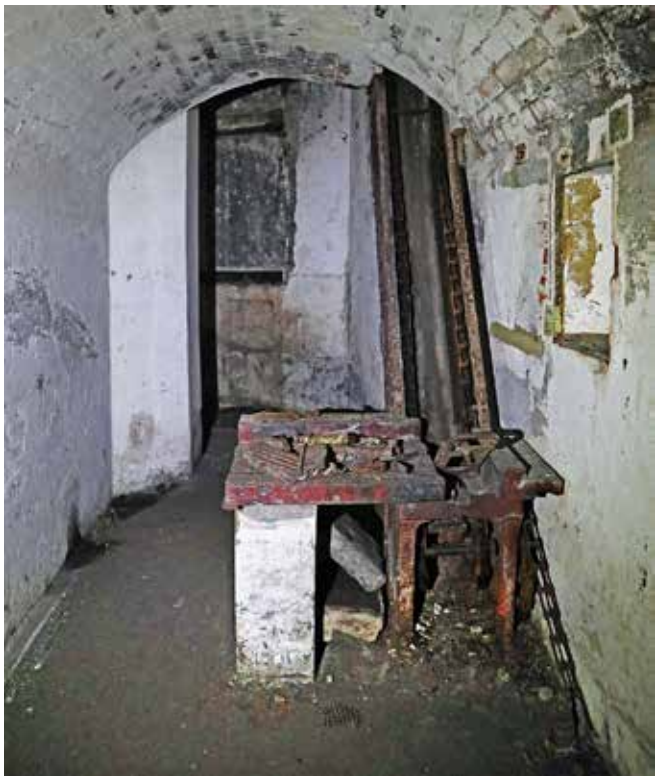
A dominating feature was the 3-storey Battery Observation Post which still retained a fair amount of its World War II camouflage. This disguised it as a sea-front cottage, complete with front door, windows and even drawn curtains. It is locally known as the Dolls' House for obvious reasons.

Track leading to gun sheds, stores and generator buildings. Photo Bob Clary

Inside Battery Observation Post. Photo Bob Clary

… and below

Beneath ground lay some fascinating structures, each gun emplacement had an associated magazine with the main magazine being particularly impressive. Lamp recesses,



Shell hoist in main underground magazine. Photo Bob Clary

shifting lobbies, issue hatches and shell hoists could all be distinguished. Most of the guns also had an associated personnel shelter.

Further back (west) in the site was a magnificent 19th-century underground generator house. This was originally steam powered and the coal store and generator plinths could be seen. Although little of the original equipment is in place, this is a remarkable and impressive survivor.

It must have a real novelty for most of the Victorian gunners to find they were living with electric light, decades before it became commonplace in domestic buildings. Adjacent to the generator shelter was a bombproof shelter, again dating from 1889 and with some (probably later) ventilation pipes visible.

Pre 1914 Fuel store. Photo Bob Clary

Inside 1890 Generator building. Photo Bob Clary

Around the perimeter

Many of the battery defences both seaward and landward lie outside the current property ownership but enough was accessible to add interest. Most of the various searchlight plinths are out-of-bounds but the later (above ground) diesel-powered generator house that provided their power is in good order. The location of the below ground oil and water tanks could be seen.

In areas now wooded, a fine Spigot mortar has been cleared and the site of a slit trench has been identified. One anti-tank block lies alongside the access track but there would presumably have been others. A World War II air-raid shelter is reported to be incorporated into the landward defences but was not accessible. One of the

WWI Generator Building. Photo Bob Clary

pillboxes could not be entered due to its location but the second was fully accessible.

After our guided tour there was plenty of free time for further exploration or for photography. Owners Paul Valentine and Barry Sharp have done a great job in making the site accessible without sanitising it or making it into a museum of rusty artefacts. Thanks to them and all our hosts and organisers for the day.

Resources

Plans of Beacon Hill Fort on Sub Brit Forum from Tim Wellburn

Historic England Beacon Hill Fort official scheduling: https://historicengland.org.uk/listing/the-list/list-entry/1018958

The Harwich Redoubt, a Harwich Society publication

New Home for Museum of London at former Smithfield Market

John Lill

Temporary roof above market

There has been a market in London's Smithfield for almost a thousand years. It was established on a grassy area known as Smooth Field, leading down to the eastern bank of the River Fleet. Most of the current market buildings date from the middle to the end of the nineteenth century and were designed by Victorian architect Sir Horace Jones. They are Grade II listed.

The market comprises several buildings over a large site between Charterhouse Street and West Smithfield located close to Farringdon station. These buildings stand above vaults and railway lines used to transport and store goods, most specifically meat. The tunnels of the new Elizabeth Line pass close by.

On 8 June 2022 Clive Penfold and I visited the old Smithfield Market which is under development to become the site of the new Museum of London. This was a public visit arranged by various organisations involved in the refurbishment and conversion for the Museum.

The Museum will be housed in the former general market buildings which have stood empty and derelict since the late 1990s. Works are being undertaken to make the buildings watertight and prevent collapse. Most of the structure has been saved but the roof needs to be replaced so the whole of the building site has been covered by a temporary roof to enable work to be carried out in all weather conditions.

Following our tour below the temporary roof we were led down to the basement where the rail sidings had been. The rail sidings here were connected to the Snow Hill Tunnel (opened 1866) which runs beneath the market buildings and originally included a Great Western Railway goods station, now a car park. Immediately prior to the buildings being constructed the tunnel was built using the cut and cover method and opened on 1 January 1866.

Rail access to Smithfield goods depot c1960s. Photo Dave Carson

Same view from a higher level c2015. The entrance to the goods depot is below West Smithfield. Photo Graham Nolan

View of the basement

The Morning Post of 3 November 1868 described the amenities:

> *The building for the market covers an area of 620 feet by 240 feet, and beneath the floor of this large building there is a world of railways, and sidings, and cranes, and lifts, designed to facilitate the supply of the market with its thousands of tons of meat and poultry. The Metropolitan Railway will provide access to this market for the meat-laden trains of the Great Western, Midland, Great Northern, South-Western, and Chatham and Dover Lines; and by this system of underground communication will relieve to a great extent the street traffic. Of the area below the market one half – the northern – belongs to the Metropolitan Railway Company, and the southern half to the Great Western, which has the right of passing over the rails of the Metropolitan.*

The *Morning Post* continues with information on delivered produce and derivation.

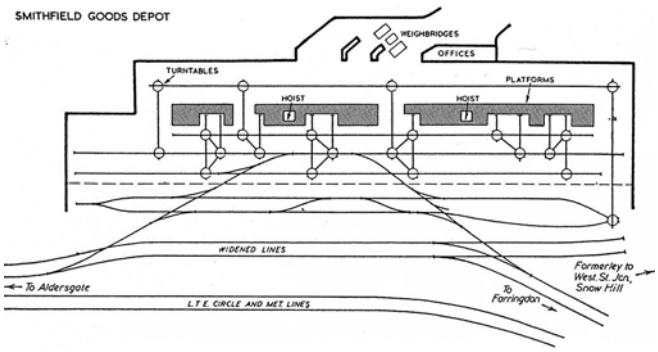
> *The Great Northern's deliveries consist of large consignments of prime beef, which start from Aberdeen, now, in fact, one of the London abattoirs. The northern counties of Scotland add to the contributions of beef as the train proceeds southwards. In the Lothians and Lowland counties of Scotland, mutton is added by tons; and onwards in England, through the northern, midland, and home counties, the load keeps constantly increasing with beef, mutton, pork, and veal. The loads of the Great Western, smaller in aggregate quantity, are higher in relative value, including, as they do, a large proportion of the finest quality of hams and bacon from Ireland and Wiltshire. The Midland brings in a large quantity of meat and poultry from Scotland, the North of Ireland, and the midland counties. The London, Chatham and Dover brings about 20 tons of game and poultry per week. The quantity of meat brought into London last year by railways is close upon 100,000 tons, and nearly the whole of this will, on the opening of the New Meat Market, be delivered from the railways below the level of the new building.*

The new Museum will be incorporated into the old vaults with temperature sensitive objects being able to be displayed. In addition, a live display in the museum will allow visitors to see Thameslink commuters beneath them as they travel in a tunnel through the museum's basement space.

The new Museum of London is due to open in 2026.

All photos by Clive Penfold unless stated

Plan of the old railway lines around Smithfield. From FollyBooks



Plan of former goods depot beneath Smithfield Market

View of Thameslink route running through the basement

Martin Briscoe Sub Brit Profile

Note from Linda Dixon, on behalf of the Committee: Martin Briscoe does a lot for Sub Brit behind the scenes - he manages updates for ROC sites on our website, he keeps an eye on sites in Scotland and often posts about them, and is one of our Forum moderators – thank you Martin!

I think I have been a member over twenty years. I studied Electronics at the University College of North Wales; one friend was a caver so we went into some of the mines and quarries in North Wales. After graduating I went to "BBC Transmitters" and worked there until retirement though we were sold off in the 1990s and went through a few name changes. In the first few years at the BBC we would be moved around and I ended up at Fort William and decided to stay here.

At the BBC, we mainly looked after the smaller sites so I got around most of the West and North of Scotland as well as trips to the Western and Northern Isles. There would be often be time to photograph places in these areas including ROC Posts for Nick Catford which I think is how I first came into contact with him. I did a series of trips to various parts of Scotland with Nick and various others for him to visit ROC Posts and ROTOR sites, including nearly all the islands in the Firth of Forth as well as Northern and Western Isles.

I do a lot of photography and try to put most of my pictures on Canmore (I have over 50,000 images on Canmore) and several Historic Environment Records. With my electronics background, my interests tend to be more towards radio and radar sites. We have a small informal group exchanging information about Y Service (wireless interception) sites including WWI ones – earlier this year I "found" a forgotten WWI one on Skye. I also "found" traces of a WWI gun battery near here that everyone said had gone when the road was re-aligned - it was built to protect the U.S. Navy shipping thousands of mines over the Atlantic for the Northern Barrage.

I was 'volunteered' to take over uploading images of ROC Posts to the Sub Brit website. For a time I photographed War Graves for the War Grave Photographic Project and did most in the North of Scotland and isles, I am now a Remote Volunteer for the Imperial War Museum War Memorial Register and when possible photograph War Memorials as well as upload others' images to the WMR – they appear to have a large number of 'orphan' images awaiting uploading.

Ice Houses of Berwick upon Tweed, Northumberland

Phil Thirkell

The front wall of the Bank Hill ice house showing the entrance tunnel.

Berwick upon Tweed is a traditional market town situated in Northumberland standing on the north bank of the mouth of the river Tweed about two and a half miles from the England/Scotland border. It is notable for its architectural features which include a Georgian town hall, medieval town walls, Elizabethan ramparts and the oldest barracks in Britain.

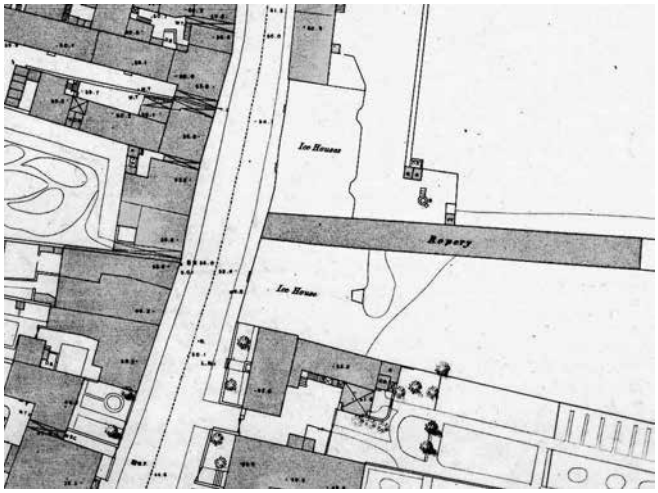
For centuries salmon has been one of the main commodities of Berwick and records of fishing on the Tweed can be traced back as far as Roman times. After the thirteenth century large quantities of salmon were being caught, pickled and cured, and sent to London via Newcastle. Because of its abundance and relative cheapness, it became a staple in the diet of the poorest. It is said that there was an informal agreement that apprentices in Newcastle would not be fed salmon more than twice a week by their masters!

At Berwick, the trade in salmon was conducted by coopers who not only produced the barrels but were responsible for buying and selling the fish as well as its pickling. It is recorded in John Fuller's 1799 *The History of Berwick upon Tweed* that, "the practice has, for some years past, been laid aside." He also records that "Mr Dempster, a member of Parliament, about 12 years ago, calling on Mr John Richardson of Perth, at his fishery, told him that it was a practice on the continent to pack salmon in ice, as it had been found to preserve them so fresh that they might be sent many hundred miles without spoiling."

There is no record of a Mr Dempster as an MP for Berwick and he was almost certainly George Dempster (1732–1818) who was MP for Perth Burghs 1761–90 who dedicated the later years of his life to improving Scottish fishing and agriculture and the living conditions of his tenants. John Fuller records that Richardson's experiment was repeated at Berwick in 1788 and "since that period several ice houses have been built."

Unfortunately, Fuller isn't precise about the number

of ice houses that were built or their locations, nor are subsequent histories of Berwick. A study of the 1852 Ordnance Survey map of the town of Berwick, at a scale of 10 ft to the mile, is a little more revealing with several being marked. There are three ice houses shown on the steep street called Ravensdowne (Grid ref NU 001 528) although F M Cowe in his *Berwick-on-Tweed: A Short Historical Guide* writes that there are two.



Detail from the Ordnance Survey map 10 ft to 1 mile of 1852 showing the ice houses on Ravensdowne. By this time there were three.

On the north side of the ropery to the east of the street the map shows Ice houses (plural!) with another on the south side. There is an ice house on Bank Hill (NT 996 530) with another on the Quay Walls, on the north side of the Dispensary (NT 998 527).

Before it became the dispensary, the forerunner of Berwick Infirmary, the building had been a private house. After 1872 it was used as the Customs House which is described by Walker as "This handsome building in the Adam style was a merchant's house, with a huge warehouse beneath, which adjoins a cavernous ice house."

More recently it has reverted to being a private house and a recent (2016?) estate agent's brochure includes a description of the warehouse/icehouse/ cellars: "There are two chambers 5.92m x 5.18m and 5.89m x 5.20, height 5.15m. It is believed that these vaulted rooms were, as well as part of the structure supporting the house above, originally used as warehouse storage for goods brought into the Quayside."

Across the other side of the river, at Tweedmouth, there is also an ice house depicted on the 1852 map (NT 994 525).

Much of the local ice was obtained from ponds at Heatherytops Farm, near Scremerston south of Berwick. In some years ice could be taken from the river or had to be imported from Norway, or from even further away. The minutes of the Berwick Shipping Company in March 1822 confirmed that the master of the ship *Albion* should be instructed to sail to Norway, Iceland or 'other polar regions' to obtain ice.

In 1972, J W Bainbridge had a paper published in *The Journal of the History of Industry and Technology* in which he recalls, as a boy in 1930s Berwick, three small doors on Ravensdowne and watching blocks of ice imported from Norway being unloaded into an ice house.

The three ice houses on Ravensdowne. The lower doorway is probably original but the upper two have been enlarged to accommodate modern usage.

The present writer has recently been advised by a previous owner that the two upper (north) ice houses are still in their original form although, having had their doorways widened, are now used as workshops/stores. They both have rear ventilation openings which open on to private allotments behind. The outline of the ice houses can be seen using satellite imagery such as Google Earth.

The rear ventilation opening of the middle ice house on Ravensdowne viewed from the allotments.

The third door is also that of an ice house although in more recent times it was used as a store for sawdust which was used to separate blocks of ice and helped in preventing them from melting.

The Bank Hill ice house is the only one in Berwick that is publicly accessible and even then, only by arrangement. It is now in the care of the Berwick Preservation Society and was designated with Grade II listing in 2011. It is usually opened on Heritage Open Days but may be seen during walking tours of the town arranged by *Time to Explore* (www.explore-northumberland.co.uk).

The ice house is built into the hillside with an earth covering. The English Heritage listing description indicates that it was constructed c.1796 and consists of an entrance tunnel with a barrel-vaulted sandstone roof and sandstone rubble walls leading into the main chamber 11m long, 7.4m wide and a vaulted roof 7.6m high. Originally, there would be at least two sets of wooden doors although there is no evidence of them now. The entrance of the Bank Hill ice house is now secured by a modern iron grill gate.

The entrance to the Bank Hill ice house showing the modern iron gate and information panel.

At both ends of the main chamber there are what appear to be bricked-up ventilation openings at ceiling height.

View of the back wall of the Bank Hill ice house from the entrance tunnel

Wartime use

During World War II, the ice house was available for use as an air-raid shelter. Against the wall furthest from the entrance tunnel are the remains of five brick cubicles which would have held Elsan-type toilet facilities for wartime use. There were also three cubicles to the left of the main entrance. Although they are no longer there, at both ends of the main chamber the "shadows" of the staircases up to doorways can be seen. These would be potential escape routes inserted at the time of the use of the ice house as a wartime shelter.

According to the *Berwick Advertiser* of 7 September 1939 the shelter could provide accommodation for 240 persons. This reported capacity appears to be rather exaggerated. Without allowing for the toilet cubicles the area per person can be calculated at about 3.6 sq ft, well below what was recommended at the time.

The back wall of the Bank Hill ice house showing five WWII toilet cubicles with the ceiling level ventilation opening and a possible emergency exit and the 'shadow' of the access stairs.

Bainbridge writes that in 1923 the Berwick Salmon Fisheries Company replaced the ice house at Bank Hill with a new one at their riverside headquarters. The *Berwickshire News and General Advertiser* of 17 July 1923 reports that the former Lifeboat Station (NT 999 524) was being converted into "a fish house with store above and on the east side of the house a concrete ice house 18 feet by 21 feet is being erected." In 1951 an ice-making plant was installed. New premises were built in 1964 at Spittal on the south side of the river and included a flake ice-making plant, a blast freezing chamber and low temperature cold store.

Bainbridge also lists a "probable" at Pancheek Shiel (NU 026 488) on Cocklawburn Beach, south of Berwick. A *shiel* is a fishing hut and it is shown, with a nearby ice house, on the first edition 6in Ordnance Survey map. Subsequent maps show the shiel but not the ice house. The earlier map shows the ice house on the landward (west) side of the shiel and, as more modern maps show some coastal erosion it is possible that the remains shown may be of the ice house rather than the fishing hut. A

recent visit in May 2022 by the present writer couldn't identify any remains that might be the shiel or the ice house.

In her definitive text book, *The Ice-houses of Britain*, Sylvia Beamon describes four ice houses in Berwick as well as the one in Tweedmouth. At the time of her book (1990), the Tweedmouth example is described as being at The Bridge Hotel (now a private house), formerly Tweedmouth House, and may have been a domestic ice house rather than a commercial one.

Entrance to the Tweedmouth ice house.

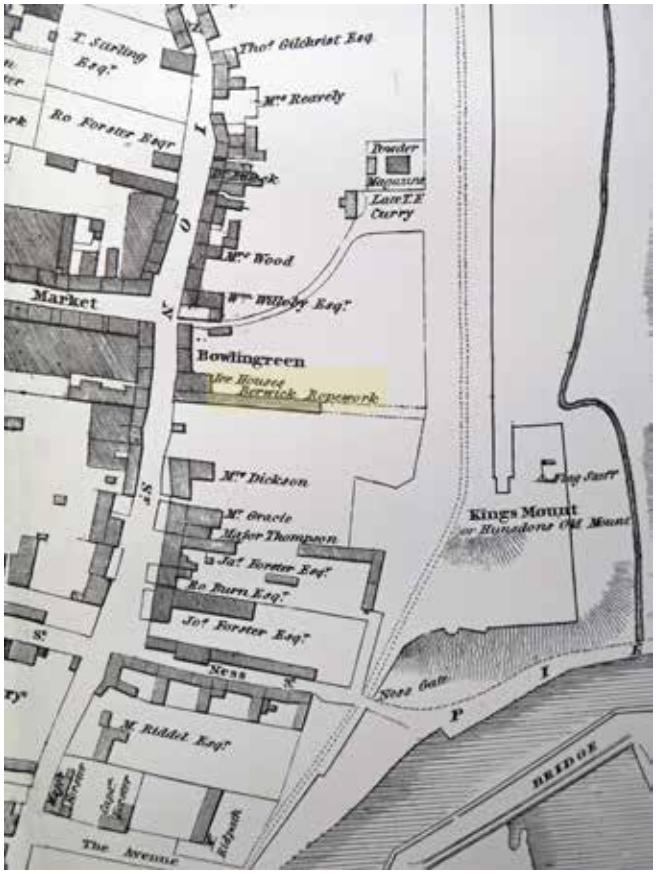
Beamon writes that, in 1980: "The ice-house lies 22ft (6.6m) below the high gardens; it is tube-shaped, being burrowed some 30ft (9m) inwards and entered from the ground level of a lower garden. Its construction is of small handmade bricks and stone slabs. A drain exists just outside the door which emptied into a dyke." The ice house is still there but it is on private property and not publicly accessible.

Of the four ice houses in Berwick that Beamon describes one is that on Bank Hill of which she writes: "It is concealed and is difficult to identify due to its tunnel-like entrance and to the shadow cast on the steep tree-covered slope by the monstrous [sic] bridge that was opened in 1928. The trees surrounding this ice-house, with diameters of 225-255cm, are considerably younger than the ice-house, which seem[s] to date from the late eighteenth century. This, therefore conforms with the late eighteenth-century local opinion that discouraged the planting of trees near ice-houses."

Today, the ice house is not difficult to find and next to the modern locked iron gate is an information plaque. A second ice house mentioned is the one that was built at the riverside headquarters of the Berwick Salmon Fisheries Company replacing that at Bank Hill.

The other two ice houses described by Beamon are both on Ravensdowne. She writes of Ravensdowne: "Just below its junction with the Woolmarket and opposite a bonded warehouse lie the Lion Gardens beneath a pair of late eighteenth-century houses. Fronting these gardens are two derelict rubble cottages and two ice-houses, all built in the 1790s."

It is interesting that she references John Wood's 1822 *Plan of the Town of Berwick upon Tweed* which does indeed show "Ice Houses" on the north side of the ropery but not a third one on the south side as shown on the 1852 Ordnance Survey map.



In his 1888 *Berwick upon Tweed. The History of the Town and Guild*, Scott lists twenty-two fisheries between the sea and the Chain Bridge, about five miles upstream from Berwick. Today there is only one, the Gardo, operated by the River Tweed Wild Salmon Company based at Tweedmouth. They use the only method legally allowed today – wear-shot netting.

This consists of rowing out into the river in a coble, a small clinker-built wooden boat, paying out a net suspended from floats in a semi-circular "shot". The coble returns to the shore and the net is winched in with its catch. It is important that the net is never static in the water otherwise the fishing would be considered illegal.

The present writer well remembers when on a family holiday at Spittal in the 1950s watching the fishing for salmon from the beach and excitedly counting the number of fish caught.

While compiling information for this article, the writer was made aware of entries in records of the Borough of Berwick that suggest that historically there could have been up to about a dozen ice houses in the town, the locations of which are now uncertain or unknown.

Of the half dozen or so that still survive all but one have been adapted for other uses and are not publicly accessible. The exception is the Bank Hill ice house which is reasonably intact, and is an interesting example of a commercial ice house, well worth a visit.

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Wood, John (1822), *Plan of the Town of Berwick upon Tweed*

Ordnance Survey (1852), *Map of Berwick upon Tweed 10ft to 1 mile*

Historic England listing for Bank Hill Ice House

Personal communication with Derek Sharman, Clare Raybould and Ralph S Holmes

Photographs by Phil Thirkell

Underground discoveries near Paphos, Cyprus

Dave Little

Some of the rock-cut tombs in the Tombs of the Kings site

Cyprus has underground structures just like most other parts of the world. We had a week in May 2022 staying in central Paphos and, without a vehicle, and using the low-cost, local bus transport plus a little walking, we found it possible to see all the sites mentioned here.

The catacombs in the Archaeological Park, Paphos

Underground items don't tend to feature highly on your average *Rough Guide*, Tripadvisor review or Tourist Information office leaflet and even the Internet does not tend to come up with them without very hard work – or good luck. One of the sites below had not appeared on any of my pre-trip research and was found only by a local information board, although it will prove mostly of interest to pre-Roman historians.

Rock-cut steps and chambers of the catacombs

Anyone visiting Paphos – which is in the southwest of Cyprus – will certainly expect to visit the Archaeological Park which is just beside the harbour and it is rightly famous for some stunning Roman mosaics. These were apparently initially discovered while the military were digging defensive trenches in WWII, then lost – and rediscovered.

This is a very large site with broadly good footpaths – and if you are prepared to walk to the far side of the site there are several large catacombs cut into the rock. These remain in good condition with remarkably little graffiti, debris or signs of fires, disposable barbecues, or typical tourist (or military) damage. There are also excavations under the amphitheatre in the centre of the site, presumably general storage.

A rather less accessible part of the catacombs

Military secrets

Totally ignored by the guidebook and information boards, and relatively visible but not acknowledged, is a concrete dugout/pillbox facing the coast. You can't officially enter this structure though I believe with a bit of effort, and no interference from site officials, access could be readily gained.

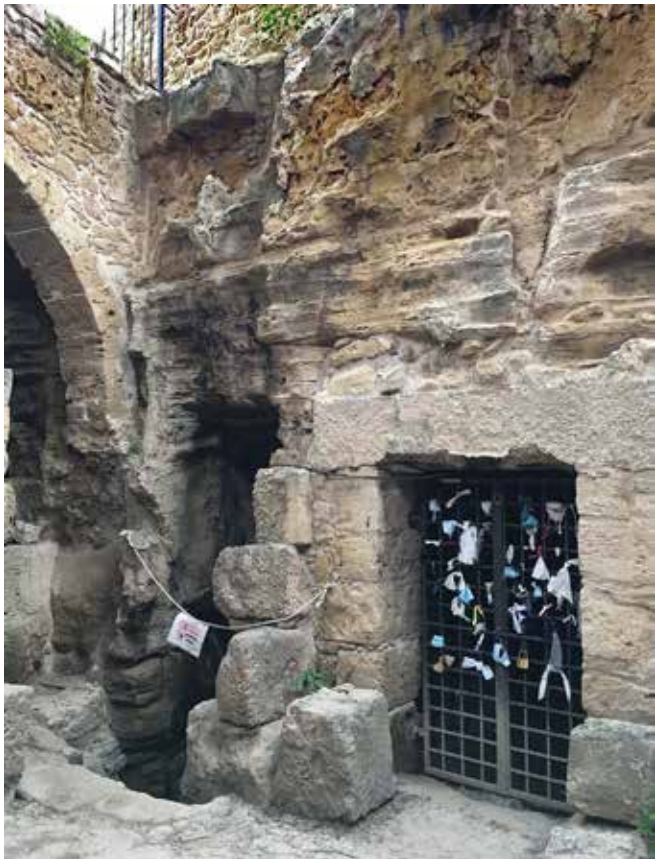
The unacknowledged but potentially accessible pillbox

This structure is located on the seaward slope about 30m from steps approaching the lighthouse – which can just be seen in the photograph – and has no detectable path to it. The scrub when we visited was quite tough and thorny and you need reasonable foot protection, certainly not sandals.

The further parts of the site are extremely overgrown, once away from the primary coach tour areas – and I suspect that there are other underground buildings here as well as other military history pre- and post-Roman era. There may be a Lidar survey data of the site; however, after so many years, and with sand from the local beach being blown over the area by storms, it may reveal little.

Supplicants may apply here

Before our visit, I had read about another area quite close to the Park and just across the road called Fabrica Hill, close to an old shrine. The shrine, though above ground, also has an underground section and this is freely accessible. There is a local tradition of tying clothes to the tree beside the shrine for religious reasons, and to the shrine itself, so you will recognise it easily when you see it.



The shrine beside Apostolou Pavlou showing some of the clothes from supplicants

Access the local way

Seen from the bus – and when walking past – the whole of Fabrica Hill in May 2022 appeared to be totally off-limits, which was also what my internet research had stated. There was lots of UK-style barrier fencing protecting a building area with new elevated walkways being built over parts of it.

A little walking around the back streets south of the shrine revealed the internet to be incorrect; access to a viewing point on the hilltop and to more caves and catacombs was revealed. Again, these places were in remarkably good condition.

The locals are still passing through the backway paths and, like most locals, are utterly disinterested in (or simply accustomed to) the site's history. They don't even seem to use the area for traditional warm evening amorous activities, possibly as it is quite overgrown and has the usual Mediterranean spiky undergrowth. There are some serious unfenced drops however, as well as some quite interesting looking features – so if you venture there, please take care.

No Kings

Next day was a morning trip to the Tombs of the Kings, a short bus ride out of town past the local shopping mall and for us, past Fabrica Hill. This is another large site for those who want to get their daily 10,000 paces in – and for those who like to see the differences in tomb designs, work-in-progress/how they constructed tombs, there is a lot to see.

For others, once you have seen one or two tombs, you have seen them all. They also did not store dead kings here – though the range of posh to poorer grade memorials is interesting as well as the size of the excavations.

Tombs of the Kings site. Photo Ted Sewell

Busman's holiday...

We then had two days travelling on area buses from Paphos bus station with locals. The bus station is just north of the Archaeological Park and beside a very good and famous Taverna where, despite my water engineering background, I was unable to work out what the machinery on the corner of the premises could be – though it appeared to be hydraulic.

On the first day we visited the still extant monastery of St Nephytos which, as you'd expect, is very restful. The saint carved his living accommodation from a cliff, by himself, about 1250AD. The cells are quite small – though presumably adequate.

As his written works became more popular and he received more visitors he excavated a further cell above the first three, pulling the ladder up after him so he would not be disturbed. He must have been quite skinny as

the hatch is small. The saint was famous for an ascetic lifestyle so maybe he did not eat much, which possibly also explains his good long life.

As requested by the monks, no photos of the cells were taken. The only thing to watch here is the bus timetable: the monastery isn't that remote but the buses are infrequent and, once you have seen it all, you wouldn't want to be stuck here for three hours – even with the small café available for nourishment. It's a steady walk back to town.

...to the middle of nowhere

Our second day of independent travel was to Kouklia, a village in the middle of nowhere. It has a small museum, Roman remains and a historic church – which turned out to be locked up tighter than the Bank of England. I am sure it's great if you can get into it as the exterior looked interesting.

Hostile vegetation defends one of the entrances to the Kouklia fortress

The village also had more tourist information boards than the rest of Paphos combined (perhaps because it's a UNESCO World Heritage Site). One mentioned another Roman mosaic – but of greater surprise, and interest, the information board asserted that about 1km up the road, past the snake farm, was a 500BC fortress with four tunnels that had been constructed for offensive/defensive reasons – and that they still existed.

We trotted off up the hill and, on the right, in a fenced compound with no signs at all, we found the very small fortress. We located three of the tunnels under old masonry and earthworks; one is blocked off after archaeological works, and one looks rather restored –however it certainly does still exist. The fourth tunnel we did not manage to locate. There is no labelling of the site at all.

The return bus departs from by the cemetery, where many of the occupants' memorials clearly reveal the Cypriot equivalent of 'beat the Jones' mentality – very ornate some of them.

Inside one of the tunnels of the 2500 year-old Kouklia fortress

The restored entrance to another of the tunnels of the Kouklia Fortress

More to see...

I am sure there is a great deal more to see in the area if we had really investigated and researched before going – and then hired a car. MOD friends tell me the eastern end of Cyprus is interesting, beyond Larnaca, as is the Turkish side.

Sadly the island and the former capital Nicosia, and its airport, remain divided by the UN-controlled Green Line zone, but for the moment visitors are warmly welcomed, and there are many attractions on both sides of the border.

Everyone in Cyprus was extremely friendly, they drive on the left and are keen on tourists. Bus travel is cheap, although the Paphos bus timetable is tricky to read – and we never discovered the tourist information office. Personally, I found Paphos rather 'Brits abroad' and lacking old-town history, but others may like that.

One interesting tip from a local expat was that if you want to visit some of the Arab states or Israel then it can be much cheaper to fly via Cyprus than direct from the UK. I have not investigated but I expect a good travel agent could readily arrange this, with a suitable short stay in Cyprus en route.